



# Triumph Lutheran Brethren Church East Campus Renovation Moorhead, Minnesota

## Project Specification Manual for Bid Package Work:

3A	CONCRETE
6A	GENERAL WORK AND LABOR
6B	MILLWORK (MATERIALS)
7G	SEALANTS
8A	DOORS / FRAMES / HARDWARE
9B	DRYWALL
9C	TILEWORK
9E	ACOUSTICAL
9G	RESILIENT FLOORING AND CARPETING
9I	PAINTING
21	BUILDING SPRINKLER SYSTEM
22	PLUMBING
23	HVAC AND TEMP CONTROLS
26	ELECTRICAL SYSTEMS
33	SITE UTILITIES



**May 15, 2026**

**ZBA Project No. 26-011**

**BID DATE & TIME:** Thursday, May 28, 2026  
at 2:00 p.m. local time

**LOCATION:** Gehrtz Construction Services  
510 4<sup>th</sup> Avenue North  
Fargo, ND 58102



**SECTION 00 0105  
CERTIFICATIONS PAGE**

**FOR THE:**

Triumph Lutheran Brethren Church  
Triumph Lutheran Brethren Church East Daycare Renovation  
2901 20th Street South  
Moorhead, Minnesota 56560

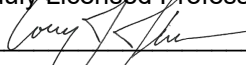
**ZERR BERG ARCHITECTS, INC.: PROJECT ARCHITECT**

I hereby certify that this specification was prepared by me or under my direct supervision, and that I am a duly Licensed Architect under the laws of the state of Minnesota.

 DATE 5/15/2026  
Tyler Brandriet - Minnesota License No. 58435

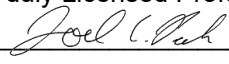
**CMTA INC.: CIVIL CONSULTANT**

I hereby certify that this specification was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the state of Minnesota.

 DATE 5/15/26  
Corey James Johnson - Minnesota License No. 63959

**CMTA INC.: MECHANICAL CONSULTANT**

I hereby certify that this specification was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the state of Minnesota.

 DATE 05/15/26  
Joel Peck - Minnesota License No. 49528

**CMTA INC.: ELECTRICAL CONSULTANT**

I hereby certify that this specification was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the state of Minnesota.

 DATE 05/15/26  
Anthony Nelson - Minnesota License No. 48553



**DESIGN TEAM**

**FOR THE**

Triumph Lutheran Brethren Church  
Triumph Lutheran Brethren Church East Daycare Renovation

**MOORHEAD, MINNESOTA**

**ZBA PROJECT NO. 26-011**

**ZERR BERG ARCHITECTS: PROJECT ARCHITECT**

510 4th Avenue North  
Fargo, ND 58102  
Tel: 701-280-0187

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**END OF SECTION**



**SECTION 00 0110  
TABLE OF CONTENTS**

**PROCUREMENT AND CONTRACTING REQUIREMENTS**

**DIVISION 00 -- PROCUREMENT AND CONTRACTING REQUIREMENTS**

- 00 0105 - Certifications Page
- 00 0110 - Table of Contents
- 00 0150 - Bid Packages Scope of Work (SOW)
- 00 1100 - Invitation for Bids
- 00 2100 - Information to Bidders
- 00 4100 - Bid Form
- 00 4325 - Substitution Request Form - During Procurement
- 00 5200 - Agreement Form
- 00 7200 - General Conditions
- 00 7300 - Supplementary Conditions

**SPECIFICATIONS**

**DIVISION 01 -- GENERAL REQUIREMENTS**

- 01 1400 - Work Restrictions
- 01 2000 - Price and Payment Procedures
- 01 2010 - Change Order Procedures
- 01 2100 - Allowances
- 01 2300 - Alternates
- 01 2600 - Work by Others
- 01 3000 - Administrative Requirements
- 01 3030 - Worksite Safety
- 01 3216 - Construction Progress Schedule
- 01 4000 - Quality Requirements
- 01 4216 - Definitions
- 01 5000 - Temporary Facilities and Controls
- 01 6000 - Product Requirements
- 01 7000 - Execution and Closeout Requirements
- 01 7800 - Closeout Submittals

**DIVISION 02 -- EXISTING CONDITIONS**

- 02 4100 - Demolition
- 02 4113 - Site Selective Demolition

**DIVISION 03 -- CONCRETE**

- 03 2000 - Concrete Reinforcing
- 03 3000 - Cast-in-Place Concrete
- 03 3512 - Concrete Surface Treatment

**DIVISION 04 -- MASONRY**

**DIVISION 05 -- METALS**

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

06 1000 - Rough Carpentry

06 4100 - Millwork

**DIVISION 07 -- THERMAL AND MOISTURE PROTECTION**

07 0553 - Fire and Smoke Assembly Identification

07 8400 - Firestopping

07 9200 - Joint Sealants

**DIVISION 08 -- OPENINGS**

08 1113 - Hollow Metal Doors and Frames

08 1416 - Flush Wood Doors

08 7100 - Door Hardware

08 8000 - Glazing

08 8813 - Fire-Rated Glazing

**DIVISION 09 -- FINISHES**

09 2116 - Gypsum Board Assemblies

09 3000 - Tiling

09 5100 - Acoustical Ceilings

09 6500 - Resilient Flooring

09 6813 - Tile Carpeting

09 9123 - Interior Painting

**DIVISION 10 -- SPECIALTIES**

10 2113.19 - Plastic Toilet Compartments

10 2600 - Wall and Door Protection

10 2800 - Toilet, Bath, and Laundry Accessories

**DIVISION 11 -- EQUIPMENT**

**DIVISION 12 -- FURNISHINGS**

12 3600 - Countertops

**DIVISION 13 -- SPECIAL CONSTRUCTION**

**DIVISION 14 -- CONVEYING EQUIPMENT**

**DIVISION 21 -- FIRE SUPPRESSION**

21 0100 - Fire Protection General Requirements

21 0150 - Fire Protection Materials & Methods

21 0500 - Common Work Results for Fire Suppression

21 0523 - General-Duty Valves for Water-Based Fire-Suppression Piping

21 0553 - Identification for Fire Suppression Piping and Equipment

21 0784 - Mechanical Firestopping

21 1100 - Facility Fire-Suppression Water-Service Piping

21 1300 - Fire-Suppression Sprinkler Systems

**DIVISION 22 -- PLUMBING**

- 22 0060 - Plumbing & Piping Demolition
- 22 0100 - Plumbing General Requirements
- 22 0150 - Plumbing & Piping Materials & Methods
- 22 0523 - General-Duty Valves for Plumbing Piping
- 22 0553 - Identification for Plumbing Piping and Equipment
- 22 0719 - Plumbing Piping Insulation
- 22 0784 - Mechanical Firestopping
- 22 1005 - Plumbing Piping
- 22 1006 - Plumbing Piping Specialties
- 22 4000 - Plumbing Fixtures

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

- 23 0060 - Mechanical Demolition
- 23 0100 - Mechanical General Requirements
- 23 0150 - Mechanical Materials & Methods
- 23 0513 - Common Motor Requirements for HVAC Equipment
- 23 0553 - Identification for HVAC Piping and Equipment
- 23 0593 - Testing, Adjusting, and Balancing for HVAC
- 23 0713 - Duct Insulation
- 23 0784 - Mechanical Firestopping
- 23 0913 - Instruments and Control Elements
- 23 0923 - Direct-Digital Control System for HVAC
- 23 3100 - HVAC Ducts and Casings
- 23 3300 - Air Duct Accessories
- 23 3423 - HVAC Power Ventilators and Exhaust Systems
- 23 3600 - Air Terminal Units
- 23 3700 - Air Outlets and Inlets

**DIVISION 25 -- INTEGRATED AUTOMATION**

**DIVISION 26 -- ELECTRICAL**

- 26 0003 - General Electrical Requirements

**DIVISION 27 -- COMMUNICATIONS**

**DIVISION 28 -- ELECTRONIC SAFETY AND SECURITY**

**DIVISION 31 -- EARTHWORK**

- 31 2200 - Site Grading
- 31 2317 - Site Excavation
- 31 2318 - Site Trenching
- 31 2324 - Site Fill

**DIVISION 32 -- EXTERIOR IMPROVEMENTS**

- 32 1123 - Site Aggregate Courses
- 32 1216 - Site Asphalt Pavement
- 32 1313 - Site Concrete Pavement

32 3113 - Site Chain Link Fences

**DIVISION 33 -- UTILITIES**

33 0111 - Site Disinfection of Water Systems

33 1416 - Site Water Distribution Piping

**SECTION 00 0150  
BID PACKAGES SCOPE OF WORK (SOW)**

**THE FOLLOWING PAGES CONTAIN INDIVIDUAL BID PACKAGE SCOPE OF WORK (SOW)  
DESCRIPTIONS INCLUDING TECHNICAL SECTIONS INCLUDED IN EACH PACKAGE.**

The Scope of Work is intended to be a general description of the items included in each Bid Package. It is not intended to be an exhaustive list of all items included and does not supercede or replace information provided elsewhere within the Construction Documents or elsewhere within the specifications.

- Bid Package 3A: Concrete
- Bid Package 6A: General Work and Labor
- Bid Package 6B: Millwork (Materials)
- Bid Package 7G: Sealants
- Bid Package 8A: Doors / Frames / Hardware
- Bid Package 9B: Drywall
- Bid Package 9C: Tilework
- Bid Package 9E: Acoustical
- Bid Package 9G: Resilient Flooring and Carpeting
- Bid Package 9I: Painting
- Bid Package 21: Building Sprinkler System
- Bid Package 22: Plumbing
- Bid Package 23: HVAC and Temp Controls
- Bid Package 26: Electrical Systems
- Bid Package 33: Site Utilities

**END OF SECTION**

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## **Bid Package 3A-Concrete**

### **1.00 BID PACKAGE SUMMARY**

- A. Comply with all specification section as contained in the project manual including but not limited to:
  - 1. Division 00 – Procurement and Contracting Requirements
  - 2. Division 01 – General Requirements
  - 3. 03 2000 – Concrete Reinforcing
  - 4. 03 3000 – Cast-in-Place Concrete
  - 5. 31 2317 – Site Excavation (as applicable)
  - 6. 31 2324 – Site Fill (as applicable)
  - 7. 32 1313 – Site Concrete Pavement (as applicable)

### **1.01 INSTALLATION AND COORDINATION**

- A. Work includes infilling concrete slabs where the mechanical contractor has cut for under slab plumbing rough-in work. Dowel into existing slab. See Mechanical plans for overall scope.
- B. All excavation or drilled piers at new stoop foundation.
- C. All excavation, fill and concrete work for new sidewalk, sidewalk and gutter repairs at new water line installation as shown on the civil C1.00 plans.
- D. All field measurements and layout work necessary for the completion of this contractor's work. Coordinate surveying and control points needed with Construction Manager.
- E. Provide and install slab on grade concrete, as specified and detailed for a complete installation.
- F. Provide and install all rebar materials.
- G. Provide and install concrete additives, hardeners, curing agents, sealers, and dust proofing compounds called out in the plans or specs for completion of contractor's work.
- H. Floor slabs must be within tolerance as noted in the spec. Concrete floors that do not meet tolerance will be filled or ground by this contractor.
- I. Finish grading at exterior work as required.
- J. Responsible for receiving, coordination, layout, and installation of embeds within cast-in-place concrete.
- K. See allowances, unit prices, and alternates as applicable.
- L. Cooperate with other trades on site in the completion of their work. Cooperation with the owners Construction Manager in the use and management of the site, and in the coordination of work with other trades.

### **1.02 SITE CLEANING AND MAINTANENCE**

- A. Debris tracked or carried off site into traffic lanes must be cleaned up immediately. If tracking continues, the Contractor shall provide continuous cleaning operations during activities of their work.
- B. Mandatory cleaning every Thursday from 2:00-4:00, see section 01 7000.
- C. Construction clean-up shall be performed daily for debris generated by this contractor.
- D. Provide and maintain all sump pumps as required for completion of this contractor's work.
- E. Removal all concrete debris and materials from site at completion of work. Concrete tools and trucks must wash out in the provided wash out pit location.
- F. Clean adjacent floors and finishes of all slurry, splatter, and any other debris from pouring or cutting slabs.

- G. Must follow OSHA guidelines for all concrete cutting operations.

### **1.03 SUBMITTALS**

- A. Provide timely submission of shop drawings, submittals, product data, and samples as noted in the specification.
- B. Submittals will be uploaded to Procore or emailed to the Construction Manager running the project.
- C. Provide phased and accelerated submittals and shop drawings for all items needed to achieve start dates and meet the project schedule.

### **1.04 MATERIAL HANDLING AND STORAGE**

- A. All equipment necessary to complete this contractor's work including but not limited to scaffold, hoists, forklifts, pumps, etc.
- B. Housekeeping and final cleanup must be completed before leaving the site weekly. Final payment will not be authorized unless site is clean.
- C. All freight and delivery charges for the delivery of material shall be paid for by this contractor.
- D. Contractor is responsible for coordinating, receiving, and off-loading of materials installed by this contractor.
- E. Storage of onsite materials shall be approved by the Construction manager and coordinated with the other trades.

### **1.05 SAFETY**

- A. Comply with all federal, state, and local safety guidelines.
- B. Comply with Gehrtz Construction Services "Site Specific Safety Plan".
- C. Every contractor needs to have a safety plan and competent person on site while the contractor is performing work.
- D. Thoroughly plan all work activities and operations so they are performed safely, as well as efficiently.
- E. Effectively communicate the health and safety requirements of Gehrtz Construction Services' Site-Specific Safety Plan to all contractors and their workers through open communications, comprehensive training, assessments, and workplace inspections.
- F. Develop an understanding, among those in leadership on this project, of their responsibilities and accountability for providing a safe and healthy workplace.
- G. Plan and coordinate work operations and activities to minimize or eliminate situations which may jeopardize worker's health and safety due to conflicting or simultaneous work operations or activities.
- H. Communicate to all workers that safety is their responsibility, and they will be held responsible, accountable, and assigned the appropriate authority for their individual safety and the safety of their co-workers.

### **1.06 SWPPP**

- A. Dewatering must follow the SWPPP and Erosion and Sediment Control guidelines.
- B. Sweep city streets and site roads as needed during excavation, hauling, backfilling, utility work, foundation work, paving, or when contractor vehicles track out of the site. (Minimum of once per week).

- C. Concrete and grout trucks, pumpers and all equipment used must wash out in a designated concrete washout pit, or into their hopper, coordinate with the Construction Manager. Details must be communicated to all persons involved in activity.



## **Bid Package 6A – General Work and Labor**

### **1.00 BID PACKAGE SUMMARY**

- A. Comply with all specification sections as contained in the project manual including but not limited to:
  - 1. Division 00 – Procurement and Contracting Requirements
  - 2. Division 01 – General Requirements
  - 3. Division 02 – Existing Conditions (as applicable)
  - 4. 06 1000 – Rough Carpentry
  - 5. 06 2000 – Finish Carpentry
  - 6. 06 4100 – Millwork (Install)
  - 7. 07 2100 – Thermal Insulation (as applicable)
  - 8. 07 2119 – Foamed in Place Insulation
  - 9. 07 2500 – Weather Barriers
  - 10. 08 1113 – Hollow Metal Doors, Frames (Install)
  - 11. 08 14160 – Flush Wood Doors (Install)
  - 12. 08 7100 – Door Hardware (Install)
  - 13. 10 2113.19 – Plastic Toilet Compartments
  - 14. 10 2600 – Wall and Door Protection
  - 15. 10 2800 – Toilet, Bath and Laundry Accessories
  - 16. 10 4400 – Fire Protection Specialties
  - 17. 12 3600– Countertops (Install)

### **1.01 INSTALLATION AND COORDINATION**

- A. Provide and remove debris from site for all demolition items noted on the drawings including but not limited to floor covering, GWB ceilings and wall systems, ACT ceilings, grid and wire, removal and salvage of all relocated doors and hardware etc.
- B. Provide and install all wood blocking as needed.
- C. Contractor to supply and install all non-liquid applied weather barriers.
- D. Coordination with other trades in the placement of blocking and backing to be used by others for the completion of their work (roof blocking and window blocking).
- E. Provide and install wood backing for all wall mounted items installed by this contract for owner
- F. Installation of all hollow metal window and door frames.
- G. Install all wood doors, hollow metal doors, and finish door hardware.
- H. Provide and install signage for fire partitions, fire walls, and barriers as noted.
- I. Contractor to install the following owner supplied items from the plans and in the specifications (soap dispensers, TV mounts, and TV's). Coordinate TV installation with the Construction Manager.
- J. Furnish and install all fire protection specialties, toilet accessories, toilet partitions, grab bars, wall and corner guards etc.
- K. Install benches, shelves and brackets in the locker rooms. Materials to be supplied by bid Package 13C.
- L. Provide and install all exterior signage and signage for fire walls, electrical rooms, mechanical rooms, etc. as shown on the plans and noted in the specifications.
- M. Install all finished wood lockers, casework and related countertops, solid surface sills, build-up strips, filler panels, support brackets, shelving, standards, and brackets, and grommet as shown and specified.

- N. Install all countertops. Contractor is responsible for all, field measurements, verifying all sizes, shapes, and rough openings of cut in fixtures and/or appliances.
- O. This contractor will coordinate field dimensions for millwork. (Coordinate with CM)
- P. Contractor is responsible for filling all nail holes created from installing finished woodwork.
- Q. Contractor is responsible for off-loading all material supplied by others but installed by this contractor. Contractor takes responsibility of material once they have unloaded it from the supplier.
- R. Provide all adhesives, anchors, nails, bolts and screws for installation of the contractors' work.
- S. This contractor is responsible for temporary partition as noted on the plans.
- T. This contractor will verify all field dimensions for supplied materials.
- U. See allowances, unit prices, and alternates as applicable.
- V. Cooperate with other trades on site in the completion of their work. Cooperation with the owners' Construction Manager in the use and management of the site, and in the coordination of work with other trades.

#### **1.02 SITE CLEANING AND MAINTANENCE**

- A. Debris tracked or carried off site into traffic lanes must be cleaned up immediately. If tracking continues, the Contractor shall provide continuous cleaning operations during activities of their work.
- B. Mandatory cleaning every Thursday from 2:00-4:00, see section 01 7000.
- C. Construction cleaning shall be performed daily for debris generated by this contractor.
- D. See Spec for other items.

#### **1.03 SUBMITALS**

- A. Provide timely submission of shop drawings, submittals, product data, and samples as noted in the specification.
- B. Submittals will be uploaded to Procore or emailed to the Construction Manager running the project.
- C. Provide phased and accelerated submittals and shop drawings for all items needed to achieve start dates and meet the project schedule.
- D. Provide warranties, maintenance, manuals, and training as specified.

#### **1.04 MATERIAL HANDLING AND STORAGE**

- A. All equipment necessary to complete this contractor's work including but not limited to scaffold, hoists, forklifts, pumps, etc.
- B. Housekeeping and final cleanup must be completed before leaving the site weekly. Final payment will not be authorized unless site is clean.
- C. All freight and delivery charges for the delivery of material shall be paid for by this contractor.
- D. Contractor is responsible for coordinating, receiving, and off-loading of materials installed by this contractor.
- E. Storage of onsite materials shall be approved by the Construction manager and coordinated with the other trades.

#### **1.05 SAFETY**

- A. Comply with all federal, state, and local safety guidelines.
- B. Comply with Gehrtz Construction Services "Site Specific Safety Plan".

- C. Every contractor needs to have a safety plan and competent person on site while the contractor is performing work.
- D. Thoroughly plan all work activities and operations so they are performed safely, as well as efficiently.
- E. Effectively communicate the health and safety requirements of Gehrtz Construction Services' Site-Specific Safety Plan to all contractors and their workers through open communications, comprehensive training, assessments, and workplace inspections.
- F. Develop an understanding, among those in leadership on this project, of their responsibilities and accountability for providing a safe and healthy workplace.
- G. Plan and coordinate work operations and activities to minimize or eliminate situations which may jeopardize worker's health and safety due to conflicting or simultaneous work operations or activities.
- H. Communicate to all workers that safety is their responsibility, and they will be held responsible, accountable, and assigned the appropriate authority for their individual safety and the safety of their co-workers.

**1.06 SWPPP**

- A. Dewatering must follow the SWPPP and Erosion and Sediment Control guidelines.
- B. Sweep city streets and site roads as needed during excavation, hauling, backfilling, utility work, foundation work, paving, or when contractor vehicles track out of the site. (Minimum of once per week).
- C. Concrete and grout trucks either need to wash out in a designated concrete washout pit, or into their hopper, coordinate with the Construction Manager. Details must be communicated to all persons involved in activity.



## **Bid Package 6B – Millwork – Materials**

### **1.00 BID PACKAGE SUMMARY**

- A. Comply with all specification section as contained in the project manual including but not limited to:
  - 1. Division 00 – Procurement and Contracting Requirements
  - 2. Division 01 – General Requirements
  - 3. 06 1000 – Miscellaneous Rough Carpentry (as applicable)
  - 4. 06 4100 – Millwork
  - 5. 10 3600 - Countertops

### **1.01 INSTALLATION AND COORDINATION**

- A. Furnish all finished wood components, casework and related countertops, solid surface sills, build up strips, filler panels, support brackets, shelving and brackets, and grommet as shown and specified.
- B. Provide seam filler as needed for solid surface sills.
- C. Contractor will supply touch-up kits and will include matching touch-up products: stain pen and/or filler stick, and nail putty.
- D. Contractor is responsible for all material deliveries and assisting the contractor with unloading. Contractor should not assume everything will be delivered in 1 or two trips.
- E. All sets of cabinetries must include a clearly labeled and dimensioned set of installation instruction shop drawings.
- F. All field measurements and layout work necessary for the completion of this contractor's work.
- G. See allowances, unit prices, and alternates as applicable.
- H. Cooperate with other trades on site in the completion of their work. Cooperation with the owner's Construction Manager in the use and management of the site, and in the coordination of work with other trades.

### **1.02 SITE CLEANING AND MAINTANENCE**

- A. Debris tracked or carried of site into traffic lanes must be cleaned up immediately. If tracking continues, the Contractor shall provide continuous cleaning operations during activities of their work.
- B. Mandatory cleaning every Thursday from 2:00-4:00, see section 01 7000.
- C. Construction cleaning shall be performed daily for debris generated by this contractor.

### **1.03 SUBMITALS**

- A. Provide timely submission of shop drawings, submittals, product data, and samples as noted in the specification.
- B. Submittals will be uploaded to Procore or emailed to the Construction Manager running the project.
- C. Provide phased and accelerated submittals and shop drawings for all items needed to achieve start dates and meet the project schedule.
- D. Provide warranties, maintenance, manuals, and training as specified.

### **1.04 MATERIAL HANDLING AND STORAGE**

- A. All equipment necessary to complete this contractor's work including but not limited to scaffold, hoists, forklifts, pumps, etc.
- B. Housekeeping and final cleanup must be completed before leaving the site weekly. Final payment will not be authorized unless site is clean.
- C. All freight and delivery charges for the delivery of material shall be paid for by this contractor.
- D. Contractor is responsible for coordinating, receiving, and off-loading of materials installed by this contractor.
- E. Storage of onsite materials shall be approved by the Construction manager and coordinated with the other trades.

#### **1.05 SAFETY**

- A. Comply with all federal, state, and local safety guidelines.
- B. Comply with Gehrtz Construction Services "Site Specific Safety Plan".
- C. Every contractor needs to have a safety plan and competent person on site while the contractor is performing work.
- D. Thoroughly plan all work activities and operations so they are performed safely, as well as efficiently.
- E. Effectively communicate the health and safety requirements of Gehrtz Construction Services' Site-Specific Safety Plan to all contractors and their workers through open communications, comprehensive training, assessments, and workplace inspections.
- F. Develop an understanding, among those in leadership on this project, of their responsibilities and accountability for providing a safe and healthy workplace.
- G. Plan and coordinate work operations and activities to minimize or eliminate situations which may jeopardize worker's health and safety due to conflicting or simultaneous work operations or activities.
- H. Communicate to all workers that safety is their responsibility, and they will be held responsible, accountable, and assigned the appropriate authority for their individual safety and the safety of their co-workers.

#### **1.06 SWPPP**

- A. Dewatering must follow the SWPPP and Erosion and Sediment Control guidelines.
- B. Sweep city streets and site roads as needed during excavation, hauling, backfilling, utility work, foundation work, paving, or when contractor vehicles track out of the site. (Minimum of once per week).
- C. Concrete and grout trucks either need to wash out in a designated concrete washout pit, or into their hopper, coordinate with the Construction Manager. Details must be communicated to all persons involved in activity.

## **Bid Package 7G – Sealants**

### **1.00 BID PACKAGE SUMMARY**

- A. Comply with all specification sections as contained in the project manual including but not limited to:
  - 1. Division 00 – Procurement and Contracting Requirements
  - 2. Division 01 – General Requirements
  - 3. 07 8400 – Firestopping
  - 4. 07 9200 – Joint Sealer

### **1.01 INSTALLATION AND COORDINATION**

- A. Furnish and install all sealant work as shown on the drawings including but not limited to all fire caulking as noted on the plans including partition to deck connections, hollow metal frames (interior and exterior), interior and exterior masonry wall control joints and expansion joints, head joints at masonry sills, interior of all aluminum windows (exterior sealant at aluminum windows is by window supplier), control joints at ceramic tile, countertops, millwork, joints where exterior concrete sidewalks meet or run alongside the building, and all joints of dissimilar materials.
- B. Contractor responsible for all fire stopping at fire walls, this includes but is not limited to any penetrations, gaps between wall and deck, or butt joints that aren't tight. BP 21, BP 22, BP 23, and BP 26 responsible for firestopping their own penetrations.
- C. Caulk all openings and penetrations in exterior walls to ensure a watertight and airtight building.
- D. Provide joint cleaner, joint primer, bond breaker type and sealant backer rod called for or required in connection with caulking.
- E. Furnish and install mineral wool, fire stopping, and plates as specified in the plans and specs at balloon framed walls, for firestopping between floors.
- F. Provide fire stopping systems to the owners Construction Manager once awarded a contract.
- G. Provide labels noting the ul listing and installation at all firestopping locations as required.
- H. All field measurements and layout work necessary for the completion of this contractor's work.
- I. See allowances, unit prices, and alternates as applicable.
- J. Cooperate with other trades on site in the completion of their work. Cooperation with the owners Construction Manager in the use and management of the site, and in the coordination of work with other trades.

### **1.02 SITE CLEANING AND MAINTANENCE**

- A. Debris tracked or carried of site into traffic lanes must be cleaned up immediately. If tracking continues, the Contractor shall provide continuous cleaning operations during activities of their work.
- B. Mandatory cleaning every Thursday from 2:00-4:00, see section 01 7000.
- C. Construction cleaning shall be performed daily for debris generated by this contractor.

### **1.03 SUBMITALS**

- A. Provide timely submission of shop drawings, submittals, product data, and samples as noted in the specification.

- B. Submittals will be uploaded to Procore or emailed to the Construction Manager running the project.
- C. Provide phased and accelerated submittals and shop drawings for all items needed to achieve start dates and meet the project schedule.
- D. Provide warranties, maintenance, manuals, and training as specified.

#### **1.04 MATERIAL HANDLING AND STORAGE**

- A. All equipment necessary to complete this contractor's work including but not limited to scaffold, hoists, forklifts, pumps, etc.
- B. Housekeeping and final cleanup must be completed before leaving the site weekly. Final payment will not be authorized unless site is clean.
- C. All freight and delivery charges for the delivery of material shall be paid for by this contractor.
- D. Contractor is responsible for coordinating, receiving, and off-loading of materials installed by this contractor.
- E. Storage of onsite materials shall be approved by the Construction manager and coordinated with the other trades.

#### **1.05 SAFETY**

- A. Comply with all federal, state, and local safety guidelines.
- B. Comply with Gehrtz Construction Services "Site Specific Safety Plan".
- C. Every contractor needs to have a safety plan and competent person on site while the contractor is performing work.
- D. Thoroughly plan all work activities and operations so they are performed safely, as well as efficiently.
- E. Effectively communicate the health and safety requirements of Gehrtz Construction Services' Site-Specific Safety Plan to all contractors and their workers through open communications, comprehensive training, assessments, and workplace inspections.
- F. Develop an understanding, among those in leadership on this project, of their responsibilities and accountability for providing a safe and healthy workplace.
- G. Plan and coordinate work operations and activities to minimize or eliminate situations which may jeopardize worker's health and safety due to conflicting or simultaneous work operations or activities.
- H. Communicate to all workers that safety is their responsibility, and they will be held responsible, accountable, and assigned the appropriate authority for their individual safety and the safety of their co-workers.

#### **1.06 SWPPP**

- A. Dewatering must follow the SWPPP and Erosion and Sediment Control guidelines.
- B. Sweep city streets and site roads as needed during excavation, hauling, backfilling, utility work, foundation work, paving, or when contractor vehicles track out of the site. (Minimum of once per week).
- C. Concrete and grout trucks either need to wash out in a designated concrete washout pit, or into their hopper, coordinate with the Construction Manager. Details must be communicated to all persons involved in activity.

## **Bid Package 8A – Doors/Frames/Hardware**

### **1.00 BID PACKAGE SUMMARY**

- A. Comply with all specification sections as contained in the project manual including but not limited to:
  - 1. Division 00 – Procurement and Contracting Requirements
  - 2. Division 01 – General Requirements
  - 3. 08 1113 – Hollow Metal Doors and Frames
  - 4. 08 1416 – Flush Wood Doors
  - 5. 08 7100 – Door Hardware
  - 6. 08 8800 - Glass and Glazing

### **1.01 INSTALLATION AND COORDINATION**

- A. Manufacture and furnish all steel hollow metal frames, doors, and window frames for glazing, including all frame reinforcing, door reinforcing, door insulation, closure panels, clip angles and anchorage, factory prime all surfaces as shown and specified.
- B. Supply all standard, pre-fitted, pre-machined, pre-finished architectural wood doors as shown and specified.
- C. Provide finish door hardware for noted hollow metal and wood doors as specified.
- D. Label all door hardware for its specified location.
- E. Supply cylinders and /or cores for all scheduled doors.
- F. This contractor to meet with the Construction Manager and Owner to identify the keying.
- G. Provide keying system and keys as specified.
- H. All field measurements and layout work necessary for the completion of this contractor's work.
- I. See allowances, unit prices, and alternates as applicable.
- J. Cooperate with other trades on site in the completion of their work. Cooperation with the owner's Construction Manager in the use and management of the site, and in the coordination of work with other trades.

### **1.02 SITE CLEANING AND MAINTANENCE**

- A. Debris tracked or carried of site into traffic lanes must be cleaned up immediately. If tracking continues, the Contractor shall provide continuous cleaning operations during activities of their work.
- B. Mandatory cleaning every Thursday from 2:00-4:00, see section 01 7000.
- C. Construction cleaning shall be performed daily for debris generated by this contractor.

### **1.03 SUBMITALS**

- A. Provide timely submission of shop drawings, submittals, product data, and samples as noted in the specification.
- B. Submittals will be uploaded to Procore or emailed to the Construction Manager running the project.
- C. Provide phased and accelerated submittals and shop drawings for all items needed to achieve start dates and meet the project schedule.
- D. Provide warranties, maintenance, manuals, and training as specified.

#### **1.04 MATERIAL HANDLING AND STORAGE**

- A. All equipment necessary to complete this contractor's work including but not limited to scaffold, hoists, forklifts, pumps, etc.
- B. Housekeeping and final cleanup must be completed before leaving the site weekly. Final payment will not be authorized unless site is clean.
- C. All freight and delivery charges for the delivery of material shall be paid for by this contractor.
- D. Contractor is responsible for coordinating, receiving, and off-loading of materials installed by this contractor.
- E. Storage of onsite materials shall be approved by the Construction manager and coordinated with the other trades.

#### **1.05 SAFETY**

- A. Comply with all federal, state, and local safety guidelines.
- B. Comply with Gehrtz Construction Services "Site Specific Safety Plan".
- C. Every contractor needs to have a safety plan and competent person on site while the contractor is performing work.
- D. Thoroughly plan all work activities and operations so they are performed safely, as well as efficiently.
- E. Effectively communicate the health and safety requirements of Gehrtz Construction Services' Site-Specific Safety Plan to all contractors and their workers through open communications, comprehensive training, assessments, and workplace inspections.
- F. Develop an understanding, among those in leadership on this project, of their responsibilities and accountability for providing a safe and healthy workplace.
- G. Plan and coordinate work operations and activities to minimize or eliminate situations which may jeopardize worker's health and safety due to conflicting or simultaneous work operations or activities.
- H. Communicate to all workers that safety is their responsibility, and they will be held responsible, accountable, and assigned the appropriate authority for their individual safety and the safety of their co-workers.

#### **1.06 SWPPP**

- A. Dewatering must follow the SWPPP and Erosion and Sediment Control guidelines.
- B. Sweep city streets and site roads as needed during excavation, hauling, backfilling, utility work, foundation work, paving, or when contractor vehicles track out of the site. (Minimum of once per week).
- C. Concrete and grout trucks either need to wash out in a designated concrete washout pit, or into their hopper, coordinate with the Construction Manager. Details must be communicated to all persons involved in activity.

## **Bid Package 9B – Drywall**

### **1.00 BID PACKAGE SUMMARY**

- A. Comply with all specification sections as contained in the project manual including but not limited to:
  - 1. Division 00 – Procurement and Contracting Requirements
  - 2. Division 01 – General Requirements
  - 3. 09 2116 – Gypsum Board Assemblies

### **1.01 INSTALLATION AND COORDINATION**

- A. Furnish and install all interior load and non-load bearing steel stud partition systems and all exterior steel stud walls, ceiling suspension systems, wall furring systems, runner tracks, bridging, diagonal bracing, resilient clips, fastener, and accessories.
- B. All above ceiling sheetrock will be fire taped and sound sealed as shown and specified by this contractor.
- C. Gypsum board systems, sheathing, joints, expansion joints, corners, trim and fasteners, all sound attenuation blanket insulation, vapor barriers, and acoustical sealants as shown and specified.
- D. Scrape all floors after taping.
- E. Sweep all floors after final sanding.
- F. Repair all walls prior to completion of the project.
- G. Shine walls after Bid Pkg. 9I primes walls, and correct any defects.
- H. Removal of all debris to the owner provided dumpster by this contractor.
- I. All field measurements and layout work necessary for the completion of this contractor's work.
- J. See allowances, unit prices, and alternates as applicable.
- K. Cooperate with other trades on site in the completion of their work. Cooperation with the owners Construction Manager in the use and management of the site, and in the coordination of work with other trades.

### **1.02 SITE CLEANING AND MAINTANENCE**

- A. Debris tracked or carried of site into traffic lanes must be cleaned up immediately. If tracking continues, the Contractor shall provide continuous cleaning operations during activities of their work.
- B. Mandatory cleaning every Thursday from 2:00-4:00, see section 01 7000.
- C. Construction cleaning shall be performed daily for debris generated by this contractor.

### **1.03 SUBMITALS**

- A. Provide timely submission of shop drawings, submittals, product data, and samples as noted in the specification.
- B. Submittals will be uploaded to Procore or emailed to the Construction Manager running the project.
- C. Provide phased and accelerated submittals and shop drawings for all items needed to achieve start dates and meet the project schedule.
- D. Provide warranties, maintenance, manuals, and training as specified.

### **1.04 MATERIAL HANDLING AND STORAGE**

- A. All equipment necessary to complete this contractor's work including but not limited to scaffold, hoists, forklifts, pumps, etc.
- B. Housekeeping and final cleanup must be completed before leaving the site weekly. Final payment will not be authorized unless site is clean.
- C. All freight and delivery charges for the delivery of material shall be paid for by this contractor.
- D. Contractor is responsible for coordinating, receiving, and off-loading of materials installed by this contractor.
- E. Storage of onsite materials shall be approved by the Construction manager and coordinated with the other trades.

#### **1.05 SAFETY**

- A. Comply with all federal, state, and local safety guidelines.
- B. Comply with Gehrtz Construction Services "Site Specific Safety Plan".
- C. Every contractor needs to have a safety plan and competent person on site while the contractor is performing work.
- D. Thoroughly plan all work activities and operations so they are performed safely, as well as efficiently.
- E. Effectively communicate the health and safety requirements of Gehrtz Construction Services' Site-Specific Safety Plan to all contractors and their workers through open communications, comprehensive training, assessments, and workplace inspections.
- F. Develop an understanding, among those in leadership on this project, of their responsibilities and accountability for providing a safe and healthy workplace.
- G. Plan and coordinate work operations and activities to minimize or eliminate situations which may jeopardize worker's health and safety due to conflicting or simultaneous work operations or activities.
- H. Communicate to all workers that safety is their responsibility, and they will be held responsible, accountable, and assigned the appropriate authority for their individual safety and the safety of their co-workers.

#### **1.06 SWPPP**

- A. Dewatering must follow the SWPPP and Erosion and Sediment Control guidelines.
- B. Sweep city streets and site roads as needed during excavation, hauling, backfilling, utility work, foundation work, paving, or when contractor vehicles track out of the site. (Minimum of once per week).
- C. Concrete and grout trucks either need to wash out in a designated concrete washout pit, or into their hopper, coordinate with the Construction Manager. Details must be communicated to all persons involved in activity.

## **Bid Package 9C – Tilework**

### **1.00 BID PACKAGE SUMMARY**

- A. Comply with all specification section as contained in the project manual including but not limited to:
  - 1. Division 00 – Procurement and Contracting Requirements
  - 2. Division 01 – General Requirements
  - 3. 09 3000 – Tiling

### **1.01 INSTALLATION AND COORDINATION**

- A. Furnish and install all tile, transitions, control joists and Schluter trim as shown and specified. Contractor is responsible for filling control joist with sealant.
- B. Furnish and install all setting materials and grout as shown on the plans and specified.
- C. Prep control and construction joints as needed.
- D. Removal of all debris to the owner provided dumpster by this contractor.
- E. All field measurements and layout work necessary for the completion of this contractor's work.
- F. See allowances, unit prices, and alternates as applicable.
- G. Cooperate with other trades on site in the completion of their work. Cooperation with the owners Construction Manager in the use and management of the site, and in the coordination of work with other trades.

### **1.02 SITE CLEANING AND MAINTANENCE**

- A. Debris tracked or carried of site into traffic lanes must be cleaned up immediately. If tracking continues, the Contractor shall provide continuous cleaning operations during activities of their work.
- B. Mandatory cleaning every Thursday from 2:00-4:00, see section 01 7000.
- C. Construction cleaning shall be performed daily for debris generated by this contractor.

### **1.03 SUBMITALS**

- A. Provide timely submission of shop drawings, submittals, product data, and samples as noted in the specification.
- B. Submittals will be uploaded to Procore or emailed to the Construction Manager running the project.
- C. Provide phased and accelerated submittals and shop drawings for all items needed to achieve start dates and meet the project schedule.
- D. Provide warranties, maintenance, manuals, and training as specified.

### **1.04 MATERIAL HANDLING AND STORAGE**

- A. All equipment necessary to complete this contractor's work including but not limited to scaffold, hoists, forklifts, pumps, etc.
- B. Housekeeping and final cleanup must be completed before leaving the site weekly. Final payment will not be authorized unless site is clean.
- C. All freight and delivery charges for the delivery of material shall be paid for by this contractor.
- D. Contractor is responsible for coordinating, receiving, and off-loading of materials installed by this contractor.

- E. Storage of onsite materials shall be approved by the Construction manager and coordinated with the other trades.

#### **1.05 SAFETY**

- A. Comply with all federal, state, and local safety guidelines.
- B. Comply with Gehrtz Construction Services "Site Specific Safety Plan".
- C. Every contractor needs to have a safety plan and competent person on site while the contractor is performing work.
- D. Thoroughly plan all work activities and operations so they are performed safely, as well as efficiently.
- E. Effectively communicate the health and safety requirements of Gehrtz Construction Services' Site-Specific Safety Plan to all contractors and their workers through open communications, comprehensive training, assessments, and workplace inspections.
- F. Develop an understanding, among those in leadership on this project, of their responsibilities and accountability for providing a safe and healthy workplace.
- G. Plan and coordinate work operations and activities to minimize or eliminate situations which may jeopardize worker's health and safety due to conflicting or simultaneous work operations or activities.
- H. Communicate to all workers that safety is their responsibility, and they will be held responsible, accountable, and assigned the appropriate authority for their individual safety and the safety of their co-workers.

#### **1.06 SWPPP**

- A. Dewatering must follow the SWPPP and Erosion and Sediment Control guidelines.
- B. Sweep city streets and site roads as needed during excavation, hauling, backfilling, utility work, foundation work, paving, or when contractor vehicles track out of the site. (Minimum of once per week).
- C. Concrete and grout trucks either need to wash out in a designated concrete washout pit, or into their hopper, coordinate with the Construction Manager. Details must be communicated to all persons involved in activity.

## **Bid Package 9E – Acoustical**

### **1.00 BID PACKAGE SUMMARY**

- A. Comply with all specification section as contained in the project manual including but not limited to:
  - 1. Division 00 – Procurement and Contracting Requirements
  - 2. Division 01 – General Requirements
  - 3. 09 5100 – Acoustical Ceilings

### **1.01 INSTALLATION AND COORDINATION**

- A. Furnish and install all suspended acoustical ceiling systems as shown and specified.
- B. Furnish and install bent aluminum, finish to match the ceiling grid system.
- C. Furnish owner stock material as specified.
- D. All field measurements and layout work necessary for the completion of this contractor's work.
- E. See allowances, unit prices, and alternates as applicable.
- F. Cooperate with other trades on site in the completion of their work. Cooperation with the owners Construction Manager in the use and management of the site, and in the coordination of work with other trades.

### **1.02 SITE CLEANING AND MAINTANENCE**

- A. Debris tracked or carried of site into traffic lanes must be cleaned up immediately. If tracking continues, the Contractor shall provide continuous cleaning operations during activities of their work.
- B. Mandatory cleaning every Thursday from 2:00-4:00, see section 01 7000.
- C. Construction cleaning shall be performed daily for debris generated by this contractor.

### **1.03 SUBMITALS**

- A. Provide timely submission of shop drawings, submittals, product data, and samples as noted in the specification.
- B. Submittals will be uploaded to Procore or emailed to the Construction Manager running the project.
- C. Provide phased and accelerated submittals and shop drawings for all items needed to achieve start dates and meet the project schedule.
- D. Provide warranties, maintenance, manuals, and training as specified.

### **1.04 MATERIAL HANDLING AND STORAGE**

- A. All equipment necessary to complete this contractor's work including but not limited to scaffold, hoists, forklifts, pumps, etc.
- B. Housekeeping and final cleanup must be completed before leaving the site weekly. Final payment will not be authorized unless site is clean.
- C. All freight and delivery charges for the delivery of material shall be paid for by this contractor.
- D. Contractor is responsible for coordinating, receiving, and off-loading of materials installed by this contractor.
- E. Storage of onsite materials shall be approved by the Construction manager and coordinated with the other trades.

#### **1.05 SAFETY**

- A. Comply with all federal, state, and local safety guidelines.
- B. Comply with Gehrtz Construction Services "Site Specific Safety Plan".
- C. Every contractor needs to have a safety plan and competent person on site while the contractor is performing work.
- D. Thoroughly plan all work activities and operations so they are performed safely, as well as efficiently.
- E. Effectively communicate the health and safety requirements of Gehrtz Construction Services' Site-Specific Safety Plan to all contractors and their workers through open communications, comprehensive training, assessments, and workplace inspections.
- F. Develop an understanding, among those in leadership on this project, of their responsibilities and accountability for providing a safe and healthy workplace.
- G. Plan and coordinate work operations and activities to minimize or eliminate situations which may jeopardize worker's health and safety due to conflicting or simultaneous work operations or activities.
- H. Communicate to all workers that safety is their responsibility, and they will be held responsible, accountable, and assigned the appropriate authority for their individual safety and the safety of their co-workers.

#### **1.06 SWPPP**

- A. Dewatering must follow the SWPPP and Erosion and Sediment Control guidelines.
- B. Sweep city streets and site roads as needed during excavation, hauling, backfilling, utility work, foundation work, paving, or when contractor vehicles track out of the site. (Minimum of once per week).
- C. Concrete and grout trucks either need to wash out in a designated concrete washout pit, or into their hopper, coordinate with the Construction Manager. Details must be communicated to all persons involved in activity.

## **Bid Package 9G – Resilient Flooring/Carpeting**

### **1.00 BID PACKAGE SUMMARY**

- A. Comply with all specification section as contained in the project manual including but not limited to:
  - 1. Division 00 – Procurement and Contracting Requirements
  - 2. Division 01 – General Requirements
  - 3. 09 6500 – Resilient Flooring
  - 4. 09 6813 – Tile Carpeting

### **1.01 INSTALLATION AND COORDINATION**

- A. Furnish and install all flooring, base, vinyl tile, carpeting, and transition strips.
- B. Furnish and install a build-up material to provide smooth transitions from resilient flooring to other flooring materials.
- C. Floor preparation, floor filling and minor grinding, adhesive and accessories as shown and specified.
- D. Furnish owner stock material as specified.
- E. All field measurements and layout work necessary for the completion of this contractor's work.
- F. See allowances, unit prices, and alternates as applicable.
- G. Cooperate with other trades on site in the completion of their work. Cooperation with the owners Construction Manager in the use and management of the site, and in the coordination of work with other trades.

### **1.02 SITE CLEANING AND MAINTANENCE**

- A. Debris tracked or carried of site into traffic lanes must be cleaned up immediately. If tracking continues, the Contractor shall provide continuous cleaning operations during activities of their work.
- B. Mandatory cleaning every Thursday from 2:00-4:00, see section 01 7000.
- C. Construction cleaning shall be performed daily for debris generated by this contractor.

### **1.03 SUBMITALS**

- A. Provide timely submission of shop drawings, submittals, product data, and samples as noted in the specification.
- B. Submittals will be uploaded to Procore or emailed to the Construction Manager running the project.
- C. Provide phased and accelerated submittals and shop drawings for all items needed to achieve start dates and meet the project schedule.
- D. Provide warranties, maintenance, manuals, and training as specified.

### **1.04 MATERIAL HANDLING AND STORAGE**

- A. All equipment necessary to complete this contractor's work including but not limited to scaffold, hoists, forklifts, pumps, etc.
- B. Housekeeping and final cleanup must be completed before leaving the site weekly. Final payment will not be authorized unless site is clean.
- C. All freight and delivery charges for the delivery of material shall be paid for by this contractor.

- D. Contractor is responsible for coordinating, receiving, and off-loading of materials installed by this contractor.
- E. Storage of onsite materials shall be approved by the Construction manager and coordinated with the other trades.

**1.05 SAFETY**

- A. Comply with all federal, state, and local safety guidelines.
- B. Comply with Gehrtz Construction Services "Site Specific Safety Plan".
- C. Every contractor needs to have a safety plan and competent person on site while the contractor is performing work.
- D. Thoroughly plan all work activities and operations so they are performed safely, as well as efficiently.
- E. Effectively communicate the health and safety requirements of Gehrtz Construction Services' Site-Specific Safety Plan to all contractors and their workers through open communications, comprehensive training, assessments, and workplace inspections.
- F. Develop an understanding, among those in leadership on this project, of their responsibilities and accountability for providing a safe and healthy workplace.
- G. Plan and coordinate work operations and activities to minimize or eliminate situations which may jeopardize worker's health and safety due to conflicting or simultaneous work operations or activities.
- H. Communicate to all workers that safety is their responsibility, and they will be held responsible, accountable, and assigned the appropriate authority for their individual safety and the safety of their co-workers.

**1.06 SWPPP**

- A. Dewatering must follow the SWPPP and Erosion and Sediment Control guidelines.
- B. Sweep city streets and site roads as needed during excavation, hauling, backfilling, utility work, foundation work, paving, or when contractor vehicles track out of the site. (Minimum of once per week).
- C. Concrete and grout trucks either need to wash out in a designated concrete washout pit, or into their hopper, coordinate with the Construction Manager. Details must be communicated to all persons involved in activity.

## **Bid Package 9I - Painting**

### **1.00 BID PACKAGE SUMMARY**

- A. Comply with all specification section as contained in the project manual including but not limited to:
  - 1. Division 00 – Procurement and Contracting Requirements
  - 2. Division 01 – General Requirements
  - 3. 09 9123 – Interior Painting

### **1.01 INSTALLATION AND COORDINATION**

- A. Furnish and install all painting materials including surface preparations as shown and specified. Contractor shall clean / scrape surfaces as required for a smooth finish.
- B. Paint all walls, soffits, doors, frames, access panels and all other items noted on the plans and specs.
- C. Fill minor imperfections with spackle prior to painting.
- D. Primer coat to be back rolled.
- E. Mask all adjacent surfaces to avoid overspray.
- F. Prep all frames and walls by removing debris and foreign substances prior to finish paint.
- G. Contractor shall be responsible for masking to protect from paint and overspray. Remove masking once work is complete.
- H. Provide extra stock as specified.
- I. All field measurements and layout work necessary for the completion of this contractor's work.
- J. See allowances, unit prices, and alternates as applicable.
- K. Cooperate with other trades on site in the completion of their work. Cooperation with the owners Construction Manager in the use and management of the site, and in the coordination of work with other trades.

### **1.02 SITE CLEANING AND MAINTANENCE**

- A. Debris tracked or carried of site into traffic lanes must be cleaned up immediately. If tracking continues, the Contractor shall provide continuous cleaning operations during activities of their work.
- B. Mandatory cleaning every Thursday from 2:00-4:00, see section 01 7000.
- C. Construction cleaning shall be performed daily for debris generated by this contractor.

### **1.03 SUBMITALS**

- A. Provide timely submission of shop drawings, submittals, product data, and samples as noted in the specification.
- B. Submittals will be uploaded to Procore or emailed to the Construction Manager running the project.
- C. Provide phased and accelerated submittals and shop drawings for all items needed to achieve start dates and meet the project schedule.
- D. Provide warranties, maintenance, manuals, and training as specified.

### **1.04 MATERIAL HANDLING AND STORAGE**

- A. All equipment necessary to complete this contractor's work including but not limited to scaffold, hoists, forklifts, pumps, etc.

- B. Housekeeping and final cleanup must be completed before leaving the site weekly. Final payment will not be authorized unless site is clean.
- C. All freight and delivery charges for the delivery of material shall be paid for by this contractor.
- D. Contractor is responsible for coordinating, receiving, and off-loading of materials installed by this contractor.
- E. Storage of onsite materials shall be approved by the Construction manager and coordinated with the other trades.

**1.05 SAFETY**

- A. Comply with all federal, state, and local safety guidelines.
- B. Comply with Gehrtz Construction Services "Site Specific Safety Plan".
- C. Every contractor needs to have a safety plan and competent person on site while the contractor is performing work.
- D. Thoroughly plan all work activities and operations so they are performed safely, as well as efficiently.
- E. Effectively communicate the health and safety requirements of Gehrtz Construction Services' Site-Specific Safety Plan to all contractors and their workers through open communications, comprehensive training, assessments, and workplace inspections.
- F. Develop an understanding, among those in leadership on this project, of their responsibilities and accountability for providing a safe and healthy workplace.
- G. Plan and coordinate work operations and activities to minimize or eliminate situations which may jeopardize worker's health and safety due to conflicting or simultaneous work operations or activities.
- H. Communicate to all workers that safety is their responsibility, and they will be held responsible, accountable, and assigned the appropriate authority for their individual safety and the safety of their co-workers.

**1.06 SWPPP**

- A. Dewatering must follow the SWPPP and Erosion and Sediment Control guidelines.
- B. Sweep city streets and site roads as needed during excavation, hauling, backfilling, utility work, foundation work, paving, or when contractor vehicles track out of the site. (Minimum of once per week).
- C. Concrete and grout trucks either need to wash out in a designated concrete washout pit, or into their hopper, coordinate with the Construction Manager. Details must be communicated to all persons involved in activity.

## **Bid Package 21 – Building Sprinkler System**

### **1.00 BID PACKAGE SUMMARY**

- A. Comply with all specification sections as contained in the project manual including but not limited to:
  - 1. Division 00 – Procurement and Contracting Requirements
  - 2. Division 01 – General Requirements
  - 3. 07 8400 – Firestopping (as applicable)
  - 4. 21 0150 – Fire Protection Materials and Methods
  - 5. 21 0500 – Common Work Results for Fire Suppression
  - 6. 21 0523 – General-Duty Valves for Water-Based Fire-Suppression Piping
  - 7. 21 0553 – Identification Fore Fire Suppression Piping and Equipment.
  - 8. 21 0784 \_ Mechanical Firestopping
  - 9. 21 1100 – Facility Fire-Suppression Water-Service Piping
  - 10. 21 1300 – Fire Suppression Sprinkler Systems

### **1.01 INSTALLATION AND COORDINATION**

- A. Furnish and install the complete and operable automatic wet and dry pipe, fire department valves for the building and structures, including all pipe, fitting, valves, hangers, markers, and specialties, all sprinklers, fire department valve cabinets, backflow preventor, alarms, Siamese, signage, meters, controllers, and accessories.
- B. Acoustical or fire sealant at all penetrations through walls and floors.
- C. Provide sprinkler head cabinet with spare sprinkler heads as specified, to be turned over to the Owner.
- D. Provide wire cages at sprinkler heads where required.
- E. Coordinate with Electrical and Mechanical contractors to ensure proper connection.
- F. Provide timely submission of shop drawings, submittals, product data, and samples and working plans prepared pursuant of the requirements in NFPA 13 for obtaining approval of the authority having jurisdiction as noted in the specification.
- G. Provide fire stopping systems to the owners Construction Manager once awarded a contract.
- H. All field measurements and layout work necessary for the completion of this contractor's work.
- I. See allowances, unit prices, and alternates as applicable.
- J. Cooperate with other trades on site in the completion of their work. Cooperation with the owners Construction Manager in the use and management of the site, and in the coordination of work with other trades.

### **1.02 SITE CLEANING AND MAINTANENCE**

- A. Debris tracked or carried of site into traffic lanes must be cleaned up immediately. If tracking continues, the Contractor shall provide continuous cleaning operations during activities of their work.
- B. Mandatory cleaning every Thursday from 2:00-4:00, see section 01 7000.
- C. Construction cleaning shall be performed daily for debris generated by this contractor.

### **1.03 SUBMITALS**

- A. Provide timely submission of shop drawings, submittals, product data, and samples as noted in the specification.
- B. Submittals will be uploaded to Procore or emailed to the Construction Manager running the project.
- C. Provide phased and accelerated submittals and shop drawings for all items needed to achieve start dates and meet the project schedule.
- D. Accurate set of as-built drawings at the completion of the project.
- E. Provide warranties, maintenance, manuals, and training as specified.

#### **1.04 MATERIAL HANDLING AND STORAGE**

- A. All equipment necessary to complete this contractor's work including but not limited to scaffold, hoists, forklifts, pumps, etc.
- B. Housekeeping and final cleanup must be completed before leaving the site weekly. Final payment will not be authorized unless site is clean.
- C. All freight and delivery charges for the delivery of material shall be paid for by this contractor.
- D. Contractor is responsible for coordinating, receiving, and off-loading of materials installed by this contractor.
- E. Storage of onsite materials shall be approved by the Construction manager and coordinated with the other trades.

#### **1.05 SAFETY**

- A. Comply with all federal, state, and local safety guidelines.
- B. Comply with Gehrtz Construction Services "Site Specific Safety Plan".
- C. Every contractor needs to have a safety plan and competent person on site while the contractor is performing work.
- D. Thoroughly plan all work activities and operations so they are performed safely, as well as efficiently.
- E. Effectively communicate the health and safety requirements of Gehrtz Construction Services' Site-Specific Safety Plan to all contractors and their workers through open communications, comprehensive training, assessments, and workplace inspections.
- F. Develop an understanding, among those in leadership on this project, of their responsibilities and accountability for providing a safe and healthy workplace.
- G. Plan and coordinate work operations and activities to minimize or eliminate situations which may jeopardize worker's health and safety due to conflicting or simultaneous work operations or activities.
- H. Communicate to all workers that safety is their responsibility, and they will be held responsible, accountable, and assigned the appropriate authority for their individual safety and the safety of their co-workers.

#### **1.06 SWPPP**

- A. Dewatering must follow the SWPPP and Erosion and Sediment Control guidelines.
- B. Sweep city streets and site roads as needed during excavation, hauling, backfilling, utility work, foundation work, paving, or when contractor vehicles track out of the site. (Minimum of once per week).

- C. Concrete and grout trucks either need to wash out in a designated concrete washout pit, or into their hopper, coordinate with the Construction Manager. Details must be communicated to all persons involved in activity.



## **Bid Package 22 – Plumbing**

### **1.00 BID PACKAGE SUMMARY**

- A. Comply with all specification sections as contained in the project manual including but not limited to:
  - 1. Division 00 – Procurement and Contracting Requirements
  - 2. Division 01 – General Requirements
  - 3. 07 8400 – Firestopping
  - 4. 22 0060 – Plumbing and Piping Demolition
  - 5. 22 0100 – Plumbing General Requirements
  - 6. 22 0150 – Plumbing Piping Materials & Methods
  - 7. 22 0523 – General Duty Valves for Plumbing Piping
  - 8. 22 0553 – Identification for Plumbing Piping and Equipment
  - 9. 22 0719 – Plumbing Piping Insulation
  - 10. 22 0784 – Mechanical Firestopping
  - 11. 22 1005 – Plumbing Piping
  - 12. 22 1006 – Plumbing Piping Specialties
  - 13. 22 4000 – Plumbing Fixtures

### **1.01 INSTALLATION AND COORDINATION**

- A. Furnish and install all building domestic water distribution systems, natural gas piping, and waste and vent piping as shown, detailed, and specified.
- B. Provide and install pipe insulation and labeling.
- C. Include rough-ins and connections to all owner supplied equipment as shown.
- D. Provide and coordinate all plumbing inspections.
- E. Coordinate with Electrical and Mechanical contractors to ensure proper installation.
- F. Acoustical and fire sealant at all penetrations through walls and floors.
- G. Contractor shall backfill all trenches with specified materials to within .10 of finish grade after underground rough-in is completed. (Fine grading by others) Contractor is responsible for furnishing the backfill materials needed to complete their work. Removal of excess spoils is the responsibility of this contractor.
- H. Provide fire stopping systems to the owners Construction Manager once awarded a contract.
- I. All field measurements and layout work necessary for the completion of this contractor's work.
- J. See allowances, unit prices, and alternates as applicable.
- K. Cooperate with other trades on site in the completion of their work. Cooperation with the owners Construction Manager in the use and management of the site, and in the coordination of work with other trades.

### **1.02 SITE CLEANING AND MAINTANENCE**

- A. Debris tracked or carried of site into traffic lanes must be cleaned up immediately. If tracking continues, the Contractor shall provide continuous cleaning operations during activities of their work.
- B. Mandatory cleaning every Thursday from 2:00-4:00, see section 01 7000.

- C. Construction cleaning shall be performed daily for debris generated by this contractor.
- D. Provide and maintain all sump pumps as required for completion of this contractor's work.

### **1.03 SUBMITALS**

- A. Provide timely submission of shop drawings, submittals, product data, and samples as noted in the specification.
- B. Submittals will be uploaded to Procore or emailed to the Construction Manager running the project.
- C. Provide phased and accelerated submittals and shop drawings for all items needed to achieve start dates and meet the project schedule.
- D. Accurate set of as-built drawings at the completion of the project.
- E. Provide warranties, maintenance, manuals, and training as specified.

### **1.04 MATERIAL HANDLING AND STORAGE**

- A. All equipment necessary to complete this contractor's work including but not limited to scaffold, hoists, forklifts, pumps, etc.
- B. Housekeeping and final cleanup must be completed before leaving the site weekly. Final payment will not be authorized unless site is clean.
- C. All freight and delivery charges for the delivery of material shall be paid for by this contractor.
- D. Contractor is responsible for coordinating, receiving, and off-loading of materials installed by this contractor.
- E. Storage of onsite materials shall be approved by the Construction manager and coordinated with the other trades.

### **1.05 SAFETY**

- A. Comply with all federal, state, and local safety guidelines.
- B. Comply with Gehrtz Construction Services "Site Specific Safety Plan".
- C. Every contractor needs to have a safety plan and competent person on site while the contractor is performing work.
- D. Thoroughly plan all work activities and operations so they are performed safely, as well as efficiently.
- E. Effectively communicate the health and safety requirements of Gehrtz Construction Services' Site-Specific Safety Plan to all contractors and their workers through open communications, comprehensive training, assessments, and workplace inspections.
- F. Develop an understanding, among those in leadership on this project, of their responsibilities and accountability for providing a safe and healthy workplace.
- G. Plan and coordinate work operations and activities to minimize or eliminate situations which may jeopardize worker's health and safety due to conflicting or simultaneous work operations or activities.
- H. Communicate to all workers that safety is their responsibility, and they will be held responsible, accountable, and assigned the appropriate authority for their individual safety and the safety of their co-workers.

### **1.06 SWPPP**

- A. Dewatering must follow the SWPPP and Erosion and Sediment Control guidelines.

- B. Sweep city streets and site roads as needed during excavation, hauling, backfilling, utility work, foundation work, paving, or when contractor vehicles track out of the site. (Minimum of once per week).
- C. Concrete and grout trucks either need to wash out in a designated concrete washout pit, or into their hopper, coordinate with the Construction Manager. Details must be communicated to all persons involved in activity.



## **Bid Package 23 – HVAC and Temp Controls**

### **1.00 BID PACKAGE SUMMARY**

- A. Comply with all specification sections as contained in the project manual including but not limited to:
  - 1. Division 00 – Procurement and Contracting Requirements
  - 2. Division 01 – General Requirements
  - 3. 07 8400 – Firestopping (as applicable)
  - 4. 23 0060 – Mechanical Demolition
  - 5. 23 0100 – Mechanical General Requirements
  - 6. 23 0150 – Mechanical Materials and Methods
  - 7. 23 0513 – Common Motor Requirements for HVAC Equipment
  - 8. 23 0553 – Identification for HVAC Piping and Equipment
  - 9. 23 0593 – Testing, Adjusting, and Balancing for HVAC
  - 10. 23 0713 – Duct Insulation
  - 11. 23 0784 – Mechanical Firestopping
  - 12. 23 0913 – Instruments and Control Elements
  - 13. 23 0923 – Direct-Digital Control System for HVAC
  - 14. 23 3100 – HVAC Ducts and Casings
  - 15. 23 3300 – Air Duct Accessories
  - 16. 23 3423 – HVAC Power Ventilators
  - 17. 23 3600 – Air Terminal Units
  - 18. 23 3700 - Air Outlets and Inlets

### **1.01 INSTALLATION AND COORDINATION**

- A. Furnish and install HVAC systems as shown on the plans, detailed, and specified.
- B. Furnish and install louvers and vents as specified.
- C. Contractor shall backfill all trenches with specified materials to within .10 of finish grade after underground rough-in is completed. (Fine grading by others) Contractor is responsible for furnishing the backfill materials needed to complete their work. Removal of excess spoils is the responsibility of this contractor.
- D. Furnish and install all temperature control systems, including controllers, programming software, thermostats, sensors, all accessories, all testing, adjusting, and balancing for complete and operating system as shown and specified.
- E. Provide all permits and inspections needed throughout construction.
- F. Acoustical and fire sealant at all penetrations through walls and floors.
- G. Provide all permitting as needed for the mechanical systems.
- H. Coordinate with Electrical and Plumbing contractors to ensure proper installation.
- I. Provide fire stopping systems to the owners Construction Manager once awarded a contract.
- J. All field measurements and layout work necessary for the completion of this contractor's work.
- K. See allowances, unit prices, and alternates as applicable.

- L. Cooperate with other trades on site in the completion of their work. Cooperation with the owners Construction Manager in the use and management of the site, and in the coordination of work with other trades.

#### **1.02 SITE CLEANING AND MAINTANENCE**

- A. Debris tracked or carried of site into traffic lanes must be cleaned up immediately. If tracking continues, the Contractor shall provide continuous cleaning operations during activities of their work.
- B. Mandatory cleaning every Thursday from 2:00-4:00, see section 01 7000.
- C. Construction cleaning shall be performed daily for debris generated by this contractor.
- D. Provide and maintain all sump pumps as required for completion of this contractor's work.

#### **1.03 SUBMITALS**

- A. Provide timely submission of shop drawings, submittals, product data, and samples as noted in the specification.
- B. Submittals will be uploaded to Procore or emailed to the Construction Manager running the project.
- C. Provide phased and accelerated submittals and shop drawings for all items needed to achieve start dates and meet the project schedule.
- D. Accurate set of as-built drawings at the completion of the project.
- E. Provide warranties, maintenance, manuals, and training as specified.

#### **1.04 MATERIAL HANDLING AND STORAGE**

- A. All equipment necessary to complete this contractor's work including but not limited to scaffold, hoists, forklifts, pumps, etc.
- B. Housekeeping and final cleanup must be completed before leaving the site weekly. Final payment will not be authorized unless site is clean.
- C. All freight and delivery charges for the delivery of material shall be paid for by this contractor.
- D. Contractor is responsible for coordinating, receiving, and off-loading of materials installed by this contractor.
- E. Storage of onsite materials shall be approved by the Construction manager and coordinated with the other trades.

#### **1.05 SAFETY**

- A. Comply with all federal, state, and local safety guidelines.
- B. Comply with Gehrtz Construction Services "Site Specific Safety Plan".
- C. Every contractor needs to have a safety plan and competent person on site while the contractor is performing work.
- D. Thoroughly plan all work activities and operations so they are performed safely, as well as efficiently.
- E. Effectively communicate the health and safety requirements of Gehrtz Construction Services' Site-Specific Safety Plan to all contractors and their workers through open communications, comprehensive training, assessments, and workplace inspections.
- F. Develop an understanding, among those in leadership on this project, of their responsibilities and accountability for providing a safe and healthy workplace.

- G. Plan and coordinate work operations and activities to minimize or eliminate situations which may jeopardize worker's health and safety due to conflicting or simultaneous work operations or activities.
- H. Communicate to all workers that safety is their responsibility, and they will be held responsible, accountable, and assigned the appropriate authority for their individual safety and the safety of their co-workers.

**1.06 SWPPP**

- A. Dewatering must follow the SWPPP and Erosion and Sediment Control guidelines.
- B. Sweep city streets and site roads as needed during excavation, hauling, backfilling, utility work, foundation work, paving, or when contractor vehicles track out of the site. (Minimum of once per week).
- C. Concrete and grout trucks either need to wash out in a designated concrete washout pit, or into their hopper, coordinate with the Construction Manager. Details must be communicated to all persons involved in activity.



## **Bid Package 26 – Electrical Systems**

### **1.00 BID PACKAGE SUMMARY**

- A. Comply with all specification sections as contained in the project manual including but not limited to:
  - 1. Division 00 – Procurement and Contracting Requirements
  - 2. Division 01 – General Requirements
  - 3. 07 8400 – Firestopping (as applicable)
  - 4. 26 0003 – Electrical General Requirements

### **1.01 INSTALLATION AND COORDINATION**

- A. Furnish and install the complete and operable electrical system for the project as shown and specified, including but not limited to:
  - 1. All interior and exterior lighting fixtures, including exterior concrete lighting bases, emergency lighting fixtures, dimming equipment, lighting control equipment and branch circuit wiring,
  - 2. All special systems, including emergency lighting systems, cable tray, cable, wire, bases, devices, communications/signaling systems, including fire alarm/detection system,
  - 3. Installation and maintenance of temporary electrical power and lighting as specified.
  - 4. Includes all work specified under section 27000 and 28000
- B. Final wiring and connections for all electronic door hardware. Refer to hardware schedule and coordinate with BP 8A and 6A.
- C. See specification section 01 2100 for allowances
- D. Acoustical and fire sealant at all penetrations through walls and floors.
- E. Coordinate with plumbing and mechanical contractors to ensure proper installation.
- F. Provide fire stopping systems to the owners Construction Manager once awarded a contract.
- G. All field measurements and layout work necessary for the completion of this contractor's work.
- H. Cooperate with other trades on site in the completion of their work. Cooperation with the owners Construction Manager in the use and management of the site, and in the coordination of work with other trades.

### **1.02 SITE CLEANING AND MAINTANENCE**

- A. Debris tracked or carried of site into traffic lanes must be cleaned up immediately. If tracking continues, the Contractor shall provide continuous cleaning operations during activities of their work.
- B. Mandatory cleaning every Thursday from 2:00-4:00, see section 01 7000.
- C. Construction cleaning shall be performed daily for debris generated by this contractor.
- D. Provide and maintain all sump pumps as required for completion of this contractor's work.

### **1.03 SUBMITALS**

- A. Provide timely submission of shop drawings, submittals, product data, and samples as noted in the specification.
- B. Submittals will be uploaded to Procore or emailed to the Construction Manager running the project.

- C. Provide phased and accelerated submittals and shop drawings for all items needed to achieve start dates and meet the project schedule.
- D. Accurate set of as-built drawings at the completion of the project.
- E. Provide warranties, maintenance, manuals, and training as specified.

**1.04 MATERIAL HANDLING AND STORAGE**

- A. All equipment necessary to complete this contractor's work including but not limited to scaffold, hoists, forklifts, pumps, etc.
- B. Housekeeping and final cleanup must be completed before leaving the site weekly. Final payment will not be authorized unless site is clean.
- C. All freight and delivery charges for the delivery of material shall be paid for by this contractor.
- D. Contractor is responsible for coordinating, receiving, and off-loading of materials installed by this contractor.
- E. Storage of onsite materials shall be approved by the Construction manager and coordinated with the other trades.

**1.05 SAFETY**

- A. Comply with all federal, state, and local safety guidelines.
- B. Comply with Gehrtz Construction Services "Site Specific Safety Plan".
- C. Every contractor needs to have a safety plan and competent person on site while the contractor is performing work.
- D. Thoroughly plan all work activities and operations so they are performed safely, as well as efficiently.
- E. Effectively communicate the health and safety requirements of Gehrtz Construction Services' Site-Specific Safety Plan to all contractors and their workers through open communications, comprehensive training, assessments, and workplace inspections.
- F. Develop an understanding, among those in leadership on this project, of their responsibilities and accountability for providing a safe and healthy workplace.
- G. Plan and coordinate work operations and activities to minimize or eliminate situations which may jeopardize worker's health and safety due to conflicting or simultaneous work operations or activities.
- H. Communicate to all workers that safety is their responsibility, and they will be held responsible, accountable, and assigned the appropriate authority for their individual safety and the safety of their co-workers.

**1.06 SWPPP**

- A. Dewatering must follow the SWPPP and Erosion and Sediment Control guidelines.
- B. Sweep city streets and site roads as needed during excavation, hauling, backfilling, utility work, foundation work, paving, or when contractor vehicles track out of the site. (Minimum of once per week).
- C. Concrete and grout trucks either need to wash out in a designated concrete washout pit, or into their hopper, coordinate with the Construction Manager. Details must be communicated to all persons involved in activity.

## **Bid Package 33 – Site Utilities**

### **1.00 BID PACKAGE SUMMARY**

- A. Comply with all specification section as contained in the project manual including but not limited to:
  - 1. Division 00 – Procurement and Contracting Requirements
  - 2. Division 01 – General Requirements
  - 3. 02 4113 – Selective Demolition
  - 4. 31 2200 – Site Grading
  - 5. 31 1217 – Site Excavation
  - 6. 31 2318 – Site Trenching
  - 7. 31 2324 – Site Fill
  - 8. 32 1123 – Site Aggregate Courses
  - 9. 32 1216 – Asphalt Payment
  - 10. 33 0111– Site Disinfection of Water Systems
  - 11. 33 1416 –Water Distribution Piping

### **1.01 INSTALLATION AND COORDINATION**

- A. Surveying and testing will be provided by the owner, coordinate surveying and testing with the Construction Manager and owner’s surveying and testing agencies.
- B. Demolition as noted in the plans and specifications. (remove debris from site)
- C. Demolition at City streets for tie-ins, coordinate with Construction Manager and City or Horace, provide all street, sidewalk, curb and gutter, and landscaping repairs as needed. (All landscaping must be seeded and covered, and trees or sprinkler systems replaced).
- D. Furnish and install all storm sewer, sanitary sewer, water, and structures as indicated on the plans and specs for a complete system.
- E. Responsible for all connections to existing structures and pipe, and for all internal drops as indicated on the plans and specs.
- F. Responsible for any modifications to existing structures, valves, and piping.
- G. Contractor is responsible for hauling out all excess spoils generated from their work.
- H. Work would include all excavation, backfill, traffic control, necessary to complete the work.
- I. Responsible for calling in all locates for the completion of this contractor’s work.
- J. Responsible for coordinating private locates with the Construction Manager and the foreman for Bid Package 26.
- K. Responsible for all permits required to complete this contractor’s work.
- L. Contractor to install underground storm piping for trench drains; cap and mark for Paving Contractor to connect to.
- M. See allowances, unit prices, and alternates as applicable.
- N. Cooperate with other trades on site in the completion of their work. Cooperation with the owners Construction Manager in the use and management of the site, and in the coordination of work with other trades.

### **1.02 SITE CLEANING AND MAINTANENCE**

- A. Debris tracked or carried of site into traffic lanes must be cleaned up immediately. If tracking continues, the Contractor shall provide continuous cleaning operations during activities of their work.
- B. Mandatory cleaning every Thursday from 2:00-4:00, see section 01 7000.
- C. Construction cleaning shall be performed daily for debris generated by this contractor.
- D. Provide and maintain all sump pumps as needed for completion of contractor's work.
- E. Reinstall any storm protection that is disturbed during this contractor's work.

### **1.03 SUBMITALS**

- A. Provide timely submission of shop drawings, submittals, product data, and samples as noted in the specification.
- B. Submittals will be uploaded to Procore or emailed to the Construction Manager running the project.
- C. Provide phased and accelerated submittals and shop drawings for all items needed to achieve start dates and meet the project schedule.
- D. Accurate set of as-built drawings at the completion of the project.

### **1.04 MATERIAL HANDLING AND STORAGE**

- A. All equipment necessary to complete this contractor's work including but not limited to scaffold, hoists, forklifts, pumps, etc.
- B. Housekeeping and final cleanup must be completed before leaving the site weekly. Final payment will not be authorized unless site is clean.
- C. All freight and delivery charges for the delivery of material shall be paid for by this contractor.
- D. Contractor is responsible for coordinating, receiving, and off-loading of materials installed by this contractor.
- E. Storage of onsite materials shall be approved by the Construction manager and coordinated with the other trades.

### **1.05 SAFETY**

- A. Comply with all federal, state, and local safety guidelines.
- B. Comply with Gehrtz Construction Services "Site Specific Safety Plan".
- C. Every contractor needs to have a safety plan and competent person on site while the contractor is performing work.
- D. Thoroughly plan all work activities and operations so they are performed safely, as well as efficiently.
- E. Effectively communicate the health and safety requirements of Gehrtz Construction Services' Site-Specific Safety Plan to all contractors and their workers through open communications, comprehensive training, assessments, and workplace inspections.
- F. Develop an understanding, among those in leadership on this project, of their responsibilities and accountability for providing a safe and healthy workplace.
- G. Plan and coordinate work operations and activities to minimize or eliminate situations which may jeopardize worker's health and safety due to conflicting or simultaneous work operations or activities.

- H. Communicate to all workers that safety is their responsibility, and they will be held responsible, accountable, and assigned the appropriate authority for their individual safety and the safety of their co-workers.

**1.06 SWPPP**

- A. Dewatering must follow the SWPPP and Erosion and Sediment Control guidelines.
- B. Sweep city streets and site roads as needed during excavation, hauling, backfilling, utility work, foundation work, paving, or when contractor vehicles track out of the site. (Minimum of once per week).
- C. Concrete and grout trucks either need to wash out in a designated concrete washout pit, or into their hopper, coordinate with the Construction Manager. Details must be communicated to all persons involved in activity.



**SECTION 00 1100  
INVITATION FOR BIDS**

**PROJECT:**

Triumph Lutheran Brethren Church East Campus Renovation  
2901 20th Street South  
Moorhead, Minnesota 56560

**OWNER:**

Triumph Lutheran Brethren Church  
2901 20th Street South  
Moorhead, Minnesota 56560

**BIDS FOR THE FOLLOWING BID GROUP PACKAGES OF CONSTRUCTION WORK FOR THE PROJECT NAMED ABOVE WILL BE RECEIVED BY TRIUMPH LUTHERAN BROTHERS CHURCH UNTIL THURSDAY, MAY 28, 2026 AT 2:00 PM LOCAL TIME AT THE OFFICE OF GEHRTZ CONSTRUCTION SERVICES , 510 4TH AVENUE NORTH, FARGO, ND 58102, WHERE BIDS WILL BE OPENED PRIVATELY WITH THE OWNER.**

**BID PACKAGES:**

3A: Concrete  
6A: General Work and Labor  
6B: Millwork (Materials)  
7G: Sealants  
8A: Doors / Frames / Hardware  
9B: Drywall  
9C: Tilework  
9E: Acoustical  
9G: Resilient Flooring and Carpeting  
9I: Painting  
21: Building Sprinkler System  
22: Plumbing  
23: HVAC and Temp Controls  
26: Electrical Systems  
33: Site Utilities

The construction is expected to begin upon contract awards following the bid date. Completion of the project is scheduled for 08-15-2026. See Section 01 3216 - Project Construction Schedule for more information.

The Information to Bidders, Form of Bid, Form of Contract, Drawings, Specifications, and other contract documents may be examined at the following places:

1. North Dakota Builders Exchanges: Bismarck Mandan Builder's Exchange, Bismarck Construction Plains Exchange, Fargo-Moorhead Builder's Exchange, and Grand Forks Builders & Traders Exchange.
2. Minnesota Builders Exchanges: Minnesota Builders Exchange (Minneapolis) and St. Cloud Builders Exchange.

3. South Dakota Builders Exchanges: Aberdeen Builder's Exchange, Construction Industry Center Exchange (Rapid City), and Plains Builders Exchange (Sioux Falls).
4. Procore.

Electronic copies of the above documents may be obtained from Gehrtz Construction Services. Request documents via email at [info@gcs-fm.com](mailto:info@gcs-fm.com).

Bids shall be submitted by mail or in-person, using the bid form contained in the specifications at the following locations:

1. The Office of Gehrtz Construction Services: 510 4th Avenue North, Fargo, ND 58102.

The Owner reserves the right to waive any informality or to reject any or all bids.

No bidder may withdraw their bid within 30 days after the actual date of the opening thereof.

No Bid Bond will be required in order to submit a bid. Each bidder shall be prepared upon bid acceptance and contract award, within ten days after notice of award, to execute and effect a contract in accordance with the terms of these specifications.

**END OF SECTION**

**SECTION 00 2100  
INFORMATION TO BIDDERS**

**1.01 CONSTRUCTION MANAGEMENT METHOD OF BIDDING/CONSTRUCTING THE PROJECT**

- A. The construction work for this project, Triumph Lutheran Brethren Church East Campus Renovation, in Moorhead, Minnesota will be completed utilizing the Construction Management Agency (CMA) method of securing bids for the work and administrating the Construction Phase work. Primarily, this means that the construction work will be divided into a larger number of bid packages or divisions than the normal three - General, Mechanical and Electrical, and contracts for the work will be executed by the Owner with the contractor selected for each of these additional portions of the work.
- B. Zerr Berg Architects will provide to the Owner on this project the architectural and engineering services normal to this type of project. Gehrtz Construction Services will provide Construction Management Agency (CMA) services to the Owner and will be the on site Construction Manager. Your attention is called to Article 2 - Administration of the Contract of the General Conditions that outlines the responsibilities of each entity in this method of project construction.
- C. EACH BID PACKAGE CONTRACTOR IS HEREBY CAUTIONED TO BE AWARE THAT SOME ADDITIONAL RESPONSIBILITIES MAY BE INCLUDED IN YOUR WORK THAT IS NORMALLY PROVIDED BY A PRIME CONTRACTOR, SUCH AS LAYOUT WORK, DIMENSION VERIFICATION, COORDINATION OF WORK WITH OTHER CONTRACTORS, CLEANUP, ETC. ALSO, ALL REQUIREMENTS INCLUDED IN DIVISION 00 - CONDITIONS OF THE CONTRACT AND DIVISION 01 - GENERAL REQUIREMENTS OF THESE SPECIFICATIONS SHALL BE INCLUDED IN THE RESPONSIBILITIES OF EACH BID PACKAGE CONTRACTOR. (SEE TABLE OF CONTENTS FOR ITEMS AND SPECIFICATION SECTIONS INCLUDED IN DIVISION 00 AND DIVISION 01.)

**1.02 RECEIPT AND OPENING OF BIDS**

- A. Please provide bids on the form attached hereto for Bid Package Work for the Triumph Lutheran Brethren Church East Campus Renovation, located in Moorhead, Minnesota. Bids will be received by Triumph Lutheran Brethren Church at the office of Gehrtz Construction Services, 510 4th Avenue North, Fargo, ND 58102 until Thursday, May 28, 2026 at 2:00 pm local time, where bids will be opened privately with the Owner.
- B. Bids shall be submitted by mail or in-person, using the bid form contained in the specifications.
- C. The Owner reserves the right to waive any informality or to reject any or all bids.
- D. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof.
- E. Any bid received after the time and date specified shall not be considered.
- F. No bidder may withdraw their bid within 30 days after the actual date of the opening thereof.

**1.03 PREPARATION OF AND SUBMISSION OF BIDS**

- A. See Section 00 1100 - Invitation for Bids for bid submission requirements.
- B. Each bid must be submitted on the bid form contained in these specifications.
- C. The Owner, Architect, and Construction Manager assume no responsibility for the delivery or receiving of bids. Bidders are encouraged to submit their bids as early as possible to avoid the possibility of rejection due to late submittal.

**1.04 MODIFICATIONS OF BIDS**

- A. Modifications of bids by fax or email is not permitted.

**1.05 LAWS AND REGULATIONS**

- A. The bidder's attention is directed to the fact that all applicable State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over the construction of the

project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

- B. Bidders must hold a Minnesota Contractor's license, carry Minnesota Workmen's Compensation Insurance, and conform to all governing laws of the State of Minnesota.

#### **1.06 STATE EXCISE AND USE TAX (SALES TAX)**

- A. In submitting the bid, the bidder is understood to have included in the bid price the state excise tax on all sales of building materials, supplies and equipment to contractors, subcontractors or builders for the erection of buildings or their alteration, repair or improvement.

#### **1.07 MATERIAL ONLY CONTRACTS**

- A. "Material Only" contracts **MUST EXCLUDE** all sales or use tax and shall be bid as F.O.B. jobsite. Owner will provide purchasing agent letter and tax ID.
- B. No performance or payment bond shall be required for "Material Only" contracts.

#### **1.08 OBLIGATION OF BIDDER**

- A. At bid opening, each Bidder shall be considered to have inspected the site and to have thoroughly reviewed the Drawings and all Contract Documents (including all issued addenda). Any failure to examine any portion of the documents shall not relieve the Bidder from responsibilities associated with the submission of a bid.
- B. Bidders and Sub-bidders shall promptly notify the Architect and/or Engineer of any ambiguities, inconsistencies, or errors discovered in the Bidding Documents or in site or local conditions. No claim for additional costs arising from failure to do so will be considered.
- C. Engineers of record for the Project are identified in Section 00 0105 - Certifications Page.
- D. Requests for clarification or interpretation of the Bidding Documents shall be submitted in writing to the Architect no later than 7 days prior to the Bid Date.
- E. Interpretations, corrections, or changes to the Bidding Documents will be issued only by Addendum. Any information provided in any other manner shall not be binding, and Bidders shall not rely on such information.
- F. Where materials, products, or equipment are specified by manufacturer and name and are followed by "or **approved** equal," bids shall be based solely on the items specified or those approved as substitutions by Addendum.
- G. Where materials, products, or equipment are specified by manufacturer and name and are followed by "no exceptions," bids shall be based solely on the items specified.

#### **1.09 INDIVIDUAL BIDS**

- A. Contractors/suppliers are required to submit an individual bid for each bid package. However, contractors/suppliers may stipulate that they will only accept a contract for a combination of bid packages.
- B. Construction Manager will determine if multiple bid packages will be awarded to an individual contractor.

#### **1.10 SUBSTITUTIONS OF MATERIALS AND EQUIPMENT**

- A. Contractor's, subcontractor's, & supplier's attention is directed to specification Section 00 4325 - Substitution Request Form - During Procurement, regarding substitutions of materials and/or equipment.

#### **1.11 ALTERNATE PROPOSALS**

- A. See Section 01 2300 - Alternates, for general description of alternates. The technical sections of these specifications shall also apply to the alternate work, whether so noted in each technical section or not.

#### **1.12 METHODS OF AWARD - LOWEST QUALIFIED BIDDER**

- A. The contract will be awarded on the following basis:

1. Base bid or combination of base bid and such alternates that produce the most complete project.
2. Ability to staff the project to keep pace with construction.
3. Past performance on similar projects. Provide references upon request of the Construction Manager.
4. Approval of the owner's representative(s) of the above criteria.
5. Time of completion.

### **1.13 CONTRACTS AND SUBCONTRACTS**

- A. The bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a contract or subcontract under this contract must be acceptable to the Owner. Causes for rejection include but are not limited to the following:
  1. Poor workmanship on past projects.
  2. Lack of cooperation and/or inability to meet construction schedule on past projects.
  3. Inadequate personnel to meet construction schedule.
  4. Inability to meet project contract requirements.
- B. The lowest bidder must submit to the Construction Manager a complete list of all suppliers and subcontractors within seven (7) days after the time of the award of contract. Inability to provide a list of acceptable subcontractors shall be just cause for rejection of the bidder's proposal.

### **1.14 POWER OF ATTORNEY**

- A. Attorneys-in-fact who sign bonds on contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

### **1.15 BUILDERS RISK**

- A. Builder's Risk Insurance will be maintained by the Triumph Lutheran Brethren Church to cover all contractors. The contractor submitting the claim will be responsible for the deductible portion of the claim. The Triumph Lutheran Brethren Church will have a \$25,000 deductible. The Triumph Lutheran Brethren Church's policy does not include coverage for contractor's equipment or materials stored off-site. It is the contractor's responsibility to properly secure all on-site materials. Unsecured on-site storage is not eligible for a claim.

### **1.16 WAGES**

- A. **NO** Federal funds are involved on this project; therefore, federal wage rates **DO NOT** apply.
- B. **NO** State funds are involved on this project; therefore, State prevailing wages **DO NOT** apply.

### **1.17 TIME OF COMPLETION**

- A. Bidder must agree to commence work upon notification to proceed. The completion date is set for 08-15-2026. See Section 01 3216 - Project Construction Schedule.
- B. Work can begin in the area west of Room 100 - Vestibule on June 1, 2026. The area east of Room 100 will not be available for construction activity until June 15, 2026.

### **1.18 WORK HOURS**

- A. Normal work hours on the site shall be 7:00 am to 5:00 pm, Monday through Friday. Work outside of these hours are to be coordinated and approved by the Owner.
- B. All work that may disrupt Owner activities must be coordinated with the Construction Manager.

### **1.19 CONDITIONS OF WORK**

- A. Each bidder must inform themselves fully of the conditions relating to the construction of the project. Failure to do so will not relieve a successful bidder of their obligation to furnish all material and labor necessary to carry out the provisions of their contract. Insofar as possible, the contractor in carrying out their work must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor or the owner.
- B. Upon award of contract, successful bidders shall order materials and begin off-site equipment fabrication.

- C. Contractor's Note: If any machinery is used on the project inside the existing or new building floor to complete any work, the individual contractor shall clean and repair (at contractor's expense) any equipment or material spills, etc. caused by their work, and/or machinery to a condition satisfactory to the Construction Manager.

**1.20 WORK RESTRICTIONS**

- A. Contractors and Subcontractors shall comply with additional jobsite rules, restrictions, and responsibilities identified in Section 01 1400 - Work Restrictions.

**1.21 CONTRACT CLOSEOUT**

- A. Each contractor will be required to submit the following forms, fully executed, at the appropriate time prior to retainage reduction or final payment as requested by the Construction Manager.
  - 1. Signed lien waiver for the amount of each pay request.
  - 2. AIA G706A - Contractor's Affidavit of Release of Liens.
  - 3. AIA G706 - Contractor's Affidavit of Payment of Debts and Claims.
  - 4. AIA G734 - Certificate of Substantial Completion.

**END OF SECTION**

**SECTION 00 4100  
BID FORM**

**PROJECT:**

Triumph Lutheran Brethren Church  
Triumph Lutheran Brethren Church East Campus Renovation  
Moorhead, Minnesota

**DATE: THURSDAY, MAY 28, 2026**

Proposal of \_\_\_\_\_, hereinafter called the bidder, a  
\_\_\_\_\_ corporation / partnership / an individual, doing business as  
(State) (strike out inapplicable terms)  
\_\_\_\_\_ to Triumph Lutheran Brethren Church, hereinafter called  
the Owner.

**TO THE OWNER:**

The bidder in compliance with the Advertisement for Bids for the construction of Triumph Lutheran Brethren Church East Campus Renovation having examined the plans and specifications with related documents and the site of the proposed work and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies and to construct the project in accordance with the contract documents within the time set forth therein and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the contract documents of which this proposal is a part.

Bidder hereby agrees to commence work under this contract on or before a date noted in the Project Construction Schedule included in these specifications and to fully complete the project in the time allotted by this same schedule.

Bidder acknowledges receipt of the following addenda: \_\_\_\_\_.

Bidder acknowledges the review of Section 00 0150 - Bid Packages Scope of Work (SOW):  
\_\_\_\_\_ (initial).

**BASE PROPOSAL:**

Bidder agrees to perform all of the Construction Work described in the specifications and shown on the plans for the following Bid Package(s) for the sum of money as noted following each Bid Package: (Contractors are required to submit individual bids for each Bid Package. Bidders are allowed to submit combined bids as well.)

Bidder shall include under Base Bid all pertinent allowances described for specific Bid Packages under Section 01 2100 - Allowances.

**BID PACKAGE**

Number/Name	Amount of Bid
# _____	\$ _____
# _____	\$ _____
# _____	\$ _____
# _____	\$ _____

**IN-KIND DONATION:**

Amount to be deducted from total of contractor's bids above as an In-Kind donation to Triumph Lutheran Brethren Church. Note: Actual bid amount will be calculated by deducting this amount from the total bid above.

Deduct \$ \_\_\_\_\_

**ALTERNATE PROPOSALS: See 01 2300 - Alternates for Descriptions**

Alternate No. 1 - West Restroom.

Add/Deduct \$ \_\_\_\_\_

Alternate No. 2 - Classroom Finish Upgrades.

Add/Deduct \$ \_\_\_\_\_

Alternate No. 3 - Mother's Room.

Add/Deduct \$ \_\_\_\_\_

Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informality in the bidding.

The bidder agrees that this bid shall be good and may not be withdrawn for a period of 30 days after the scheduled closing time for receiving bids.

Upon receipt of written notice of acceptance of this bid, bidder will execute the formal contract attached within 10 days and deliver a surety bond or bonds as required by the specifications.

Respectfully submitted,

By \_\_\_\_\_  
(signature)

Title \_\_\_\_\_

Mailing Address \_\_\_\_\_

(SEAL if bid is by a Corporation) \_\_\_\_\_

Telephone No. \_\_\_\_\_

E-Mail \_\_\_\_\_

**END OF SECTION**

**SECTION 00 4325  
SUBSTITUTION REQUEST FORM - DURING PROCUREMENT**

The Substitution Request form shall be made part of these contract documents. A copy of the document is included herein.

**END OF SECTION**

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# SUBSTITUTION REQUEST

Project: Triumph Lutheran Brethren Church Substitution Request Number: \_\_\_\_\_  
East Campus Renovation From: \_\_\_\_\_  
 To: Zerr Berg Architects – Attn: Tyler Brandriet Date: \_\_\_\_\_  
510 4<sup>th</sup> Avenue North, Fargo, ND 58102 A/E Project Number: 26-011  
 Re: Substitution Request Contract For: \_\_\_\_\_

Specification Title: \_\_\_\_\_ Description: \_\_\_\_\_  
 Section: \_\_\_\_\_ Page: \_\_\_\_\_ Article/Paragraph: \_\_\_\_\_

Proposed Substitution: \_\_\_\_\_  
 Manufacturer: \_\_\_\_\_ Address: \_\_\_\_\_ Phone: \_\_\_\_\_  
 Trade Name: \_\_\_\_\_ Model No.: \_\_\_\_\_  
 Installer: \_\_\_\_\_ Address: \_\_\_\_\_ Phone: \_\_\_\_\_  
 History:  New product  2-5 years old  5-10 years old  More than 10 years old

Differences between proposed substitution and specified product: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Point-by-point comparative data attached

Reason for not providing specified item: \_\_\_\_\_  
 \_\_\_\_\_

Similar Installation:  
 Project: \_\_\_\_\_ Architect: \_\_\_\_\_  
 Address: \_\_\_\_\_ Owner: \_\_\_\_\_  
 \_\_\_\_\_ Date Installed: \_\_\_\_\_

Proposed substitution affects other parts of Work:  No  Yes; explain \_\_\_\_\_  
 \_\_\_\_\_

Savings to Owner for accepting substitution: \_\_\_\_\_ (\$ \_\_\_\_\_).

Proposed substitution changes Contract Time:  No  Yes [Add] [Deduct] \_\_\_\_\_ days.

Supporting Data Attached:  Drawings  Product Data  Samples  Tests  Reports  \_\_\_\_\_

# SUBSTITUTION REQUEST (Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: \_\_\_\_\_

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

Firm: \_\_\_\_\_

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

\_\_\_\_\_

Telephone: \_\_\_\_\_

Attachments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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### A/E's REVIEW AND ACTION

- Substitution approved - Make submittals in accordance with Specification Section 01330.
- Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
- Substitution rejected - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by:

Date:

---

Additional Comments:     Contractor     Subcontractor     Supplier     Manufacturer     A/E     \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**SECTION 00 5200  
AGREEMENT FORM**

**PART 1 GENERAL**

**1.01 FORM OF AGREEMENT**

- A. Construction Manager as Advisor
  - 1. Owner Contractor Agreement Form: AIA Document A132 - 2019 Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition shall be made a part of these Contract Documents.

**1.02 THE AGREEMENT TO BE EXECUTED IS ATTACHED FOLLOWING THIS PAGE.**

**1.03 RELATED REQUIREMENTS**

- A. Section 00 7200 - General Conditions.
- B. Section 00 7300 - Supplementary Conditions.
- C. Section 01 4216 - Definitions.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**

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# AIA<sup>®</sup> Document A132™ – 2019

## **Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition**

**AGREEMENT** made as of the    day of    in the year  
*(In words, indicate day, month, and year.)*

**BETWEEN** the Owner:  
*(Name, legal status, address, and other information)*

and the Contractor:  
*(Name, legal status, address, and other information)*

for the following Project:  
*(Name, location, and detailed description)*

The Construction Manager:  
*(Name, legal status, address, and other information)*

The Architect:  
*(Name, legal status, address, and other information)*

The Owner and Contractor agree as follows.

**ADDITIONS AND DELETIONS:**  
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Documents A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser. AIA Document A232™–2019 is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

**TABLE OF ARTICLES**

- 1 THE CONTRACT DOCUMENTS**
- 2 THE WORK OF THIS CONTRACT**
- 3 DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION**
- 4 CONTRACT SUM**
- 5 PAYMENTS**
- 6 DISPUTE RESOLUTION**
- 7 TERMINATION OR SUSPENSION**
- 8 MISCELLANEOUS PROVISIONS**
- 9 ENUMERATION OF CONTRACT DOCUMENTS**

**EXHIBIT A INSURANCE AND BONDS**

**EXHIBIT B DETERMINATION OF THE COST OF THE WORK**

**ARTICLE 1 THE CONTRACT DOCUMENTS**

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than Modifications, appears in Article 9.

**ARTICLE 2 THE WORK OF THIS CONTRACT**

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

Bid Package  
-

**ARTICLE 3 DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION**

**§ 3.1** The date of commencement of the Work shall be:

*(Check one of the following boxes.)*

- The date of this Agreement.
- A date set forth in a notice to proceed issued by the Owner.
- Established as follows:  
*(Insert a date or a means to determine the date of commencement of the Work.)*

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

Init.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

**§ 3.3 Substantial Completion of the Project or Portions Thereof**

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the date of Substantial Completion of the Work of all of the Contractors for the Project will be:

*(Paragraph Deleted)*

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of all of the Contractors for the Project are to be completed prior to Substantial Completion of the entire Work of all of the Contractors for the Project, the Contractors shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date
-----------------	-----------------------------

**§ 3.4 When the Work of this Contract, or any Portion Thereof, is Substantially Complete**

§ 3.4.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall substantially complete the entire Work of this Contract:

*(Check one of the following boxes and complete the necessary information.)*

Not later than ( ) calendar days from the date of commencement of the Work.

By the following date:

§ 3.4.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of this Contract are to be substantially complete prior to when the entire Work of this Contract shall be substantially complete, the Contractor shall substantially complete such portions by the following dates:

Portion of Work	Date to be substantially complete
-----------------	-----------------------------------

*(Paragraph Deleted)*

**ARTICLE 4 CONTRACT SUM**

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be one of the following:

*(Check the appropriate box.)*

Stipulated Sum, in accordance with Section 4.2 below

Cost of the Work plus the Contractor's Fee, in accordance with Section 4.3 below

Cost of the Work plus the Contractor's Fee with a Guaranteed Maximum Price, in accordance with Section 4.4 below

*(Based on the selection above, complete Section 4.2, 4.3 or 4.4 below.)*

**§ 4.2 Stipulated Sum**

§ 4.2.1 The Contract Sum shall be (\$ ), subject to additions and deductions as provided in the Contract Documents.

Init.

**§ 4.2.2 Alternates**

**§ 4.2.2.1** Alternates, if any, included in the Contract Sum:

Item	Price
------	-------

**§ 4.2.2.2** Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.  
*(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)*

Item	Price	Conditions for Acceptance
------	-------	---------------------------

**§ 4.2.3** Allowances, if any, included in the Contract Sum:  
*(Identify each allowance.)*

Item	Price
------	-------

**§ 4.2.4** Unit prices, if any:  
*(Identify the item and state the unit price, and quantity limitations, if any, to which the unit price will be applicable.)*

Item	Units and Limitations	Price per Unit (\$0.00)
------	-----------------------	-------------------------

| *(Paragraphs Deleted)*

| *(Table Deleted)*

| *(Paragraphs Deleted)*

| *(Table Deleted)*

| *(Paragraphs Deleted)*

| *(Table Deleted)*

| *(Paragraphs Deleted)*

| *(Table Deleted)*

| *(Paragraphs Deleted)*

| *(Table Deleted)*

| *(Paragraphs Deleted)*

**§ 4.5** Liquidated damages, if any:  
*(Insert terms and conditions for liquidated damages, if any, to be assessed in accordance with Section 3.4.)*

None

**§ 4.6 Other:**

*(Insert provisions for bonus, cost savings or other incentives, if any, that might result in a change to the Contract Sum.)*

None

**ARTICLE 5 PAYMENTS**

**§ 5.1 Progress Payments**

**§ 5.1.1** Based upon Applications for Payment submitted to the Construction Manager by the Contractor, and Certificates for Payment issued by the Construction Manager and Architect, the Owner shall make progress payments on account of the Contract Sum, to the Contractor, as provided below and elsewhere in the Contract Documents.

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

**§ 5.1.3** Provided that an Application for Payment is received by the Construction Manager not later than the twenty-fifth day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the thirtieth day of the following month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment of the amount certified shall be made by the Owner not later than sixty-five ( 65 ) days after the Construction Manager receives the Application for Payment.

*(Paragraph Deleted)*

**§ 5.1.4 Progress Payments Where the Contract Sum is Based on a Stipulated Sum**

**§ 5.1.4.1** Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Construction Manager and Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

**§ 5.1.4.2** Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

**§ 5.1.4.3** In accordance with AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

**§ 5.1.4.3.1** The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

**§ 5.1.4.3.2** The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019; and
- .5 Retainage withheld pursuant to Section 5.1.7.

**§ 5.1.5 Progress Payments Where the Contract Sum is Based on the Cost of the Work without a Guaranteed Maximum Price**

**§ 5.1.5.1** With each Application for Payment, the Contractor shall submit the cost control information required in Exhibit B, Determination of the Cost of the Work, along with payrolls, petty cash accounts, receipted invoices, or invoices with check vouchers attached, and any other evidence required by the Owner, Construction Manager or Architect to demonstrate that payments already made by the Contractor on account of the Cost of the Work equal or exceed progress payments already received by the Contractor, plus payrolls for the period covered by the present Application for Payment, less that portion of the payments attributable to the Contractor's Fee.

**§ 5.1.5.2** Applications for Payment shall show the Cost of the Work actually incurred by the Contractor through the end of the period covered by the Application for Payment and for which the Contractor has made or intends to make actual payment prior to the next Application for Payment.

**§ 5.1.5.3** In accordance with AIA Document A232-2019 and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

**§ 5.1.5.3.1** The amount of each progress payment shall first include:

- .1 The Cost of the Work as described in Exhibit B, Determination of the Cost of the Work;
- .2 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified; and
- .3 The Contractor's Fee computed upon the Cost of the Work described in the preceding Section 5.1.5.3.1.1 at the rate stated in Section 4.3.2; or if the Contractor's Fee is stated as a fixed sum in Section 4.3.2 an amount which bears the same ratio to that fixed-sum Fee as the Cost of the Work included in Section 5.1.5.3.1.1 bears to a reasonable estimate of the probable Cost of the Work upon its completion.

**§ 5.1.5.3.2** The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019;
- .5 The shortfall, if any, indicated by the Contractor in the documentation required by Section 5.1.5.1 to substantiate prior Applications for Payment, or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and
- .6 Retainage withheld pursuant to Section 5.1.7.

**§ 5.1.5.4** The Owner, Construction Manager and Contractor shall agree upon a mutually acceptable procedure for review and approval of payments to Subcontractors and the percentage of retainage held on Subcontracts, and the Contractor shall execute subcontracts in accordance with those agreements.

**§ 5.1.5.5** In taking action on the Contractor's Applications for Payment, the Construction Manager and Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor, and such action shall not be deemed to be a representation that (1) the Construction Manager and Architect have made a detailed examination, audit or arithmetic verification of the documentation submitted in accordance with Article 5 or other supporting data; (2) that the Construction Manager and Architect have made exhaustive or continuous on-site inspections; or (3) that the Construction Manager and Architect have made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contract. Such examinations,

audits and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

§ 5.1.5.6 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.1.5.7 If final completion of the Work is materially delayed through no fault of the Contractor, then the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A232-2019.

| *(Paragraphs Deleted)*

**§ 5.1.7 Retainage**

§ 5.1.7.1 For each progress payment made prior to when the Work of this Contract is substantially complete, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

| *(Paragraph Deleted)*

§ 5.1.7.1.1 The following items are not subject to retainage:

| *(Paragraph Deleted)*

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:

| *(Paragraph Deleted)*

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, when the Work of this Contract is substantially complete, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted when the Work of this Contract is substantially complete shall not include retainage as follows:

| *(Paragraph Deleted)*

**§ 5.2 Final Payment**

**§ 5.2.1 Final Payment Where the Contract Sum is Based on a Stipulated Sum**

§ 5.2.1.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A232-2019, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect.

§ 5.2.1.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment, or as follows:

See  
§ 5.1.3

Init.

| (Paragraphs Deleted)

| § 5.2.1.3 Submit final paperwork:

| (Paragraphs Deleted)

## ARTICLE 6 DISPUTE RESOLUTION

### § 6.1 Initial Decision Maker

The Architect will serve as Initial Decision Maker pursuant to Article 15 of AIA Document A232–2019, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.

*(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)*

### § 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A232–2019, the method of binding dispute resolution shall be as follows:

*(Check the appropriate box.)*

| [ ] Arbitration pursuant to Article 15 of AIA Document A232–2019.

| [ X ] Litigation in a court of competent jurisdiction.

| (Paragraph Deleted)

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

## ARTICLE 7 TERMINATION OR SUSPENSION

### § 7.1 Where the Contract Sum is a Stipulated Sum

§ 7.1.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2019.

§ 7.1.1.1 If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A232–2019, then the Owner shall pay the Contractor a termination fee as follows:

*(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner’s convenience.)*

§ 7.1.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2019.

| (Paragraphs Deleted)

### § 7.3 Suspension

The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2019; in such case, the Contract Sum and Contract Time shall be increased as provided in Article 14 of AIA Document A232–2019, except that the term “profit” shall be understood to mean the Contractor’s Fee as described in Section 4.3.2 or 4.4.2, as applicable, of this Agreement.

## ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A232–2019 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner’s representative:

*(Paragraph Deleted)*

§ 8.3 The Contractor’s representative:

*(Paragraph Deleted)*

§ 8.4 Neither the Owner’s nor the Contractor’s representative shall be changed without ten days’ prior notice to the other party.

### § 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition, Insurance and Bonds, and elsewhere in the Contract Documents.

Certificate of Insurance – list Owner, Architect, and Construction Manager as additional insureds (does not apply to supplier only contracts). See General Conditions & Supplementary Conditions for limits. Worker’s Compensation in state of project (does not apply to supplier only contracts).

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A132™–2019, Exhibit A, and elsewhere in the Contract Documents.

*(Paragraphs Deleted)*

### § 8.7 Relationship of the Parties

Where the Contract is based on the Cost of the Work plus the Contractor’s Fee, with or without a Guaranteed Maximum Price, the Contractor accepts the relationship of trust and confidence established by this Agreement and covenants with the Owner to cooperate with the Architect and exercise the Contractor’s skill and judgment in furthering the interests of the Owner; to furnish efficient business administration and supervision; to furnish at all times an adequate supply of workers and materials; and to perform the Work in an expeditious and economical manner consistent with the Owner’s interests. The Owner agrees to furnish and approve, in a timely manner, information required by the Contractor and to make payments to the Contractor in accordance with the requirements of the Contract Documents.

§ 8.8 Other provisions:

## ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition
- .2 AIA Document A132™–2019, Insurance and Bonds Exhibit

**.3 AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition**

*(Paragraphs Deleted)*

**.4 Drawings**

Number	Title	Date
Exhibit 1		

**.5 Specifications**

Section	Title	Date	Pages
Exhibit 2			

**.6 Addenda, if any:**

Number	Date	Pages

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

**.7 Other Exhibits:**

*(Paragraph Deleted)*

AIA Document A132™–2019, Determination of the Cost of the Work, Bid Form

*(Paragraphs Deleted)*

*(Table Deleted)*

Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
See Specifications, Exhibit 2	General Conditions & Supplementary Conditions		

**.8 Other documents, if any, listed below:**

*(Paragraph Deleted)*

This Agreement is entered into as of the day and year first written above.

\_\_\_\_\_  
**OWNER** *(Signature)*

\_\_\_\_\_  
**CONTRACTOR** *(Signature)*

\_\_\_\_\_  
*(Printed name and title)*

\_\_\_\_\_  
*(Printed name and title)*

# Additions and Deletions Report for AIA® Document A132™ – 2019

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 12:22:53 ET on 04/07/2021.

PAGE 2

## TABLE OF ARTICLES

...

Bid Package

...

~~ARTICLE 2~~

...

## ARTICLE 3 DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION

PAGE 3

*(Insert the date of Substantial Completion of the Work of all Contractors for the Project.)*

...

By the following date:

...

~~§ 3.4.3 If the Contractor fails to substantially complete the Work of this Contract, or portions thereof, as provided in this Section 3.4, liquidated damages, if any, shall be assessed as set forth in Section 4.5.~~

...

Stipulated Sum, in accordance with Section 4.2 below

PAGE 4

## ~~§ 4.3 Cost of the Work Plus Contractor's Fee without a Guaranteed Maximum Price~~

...

~~§ 4.3.1 The Cost of the Work is as defined in Exhibit B, Determination of the Cost of the Work.~~

...

~~§ 4.3.2 The Contractor's Fee:~~

...

~~(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee.)~~

...

~~§ 4.3.3 The method of adjustment of the Contractor's Fee for changes in the Work:~~

...

~~§ 4.3.4 Limitations, if any, on a Subcontractor's overhead and profit for increases in the cost of its portion of the Work:~~

...

~~§ 4.3.5 Rental rates for Contractor owned equipment shall not exceed percent ( %) of the standard rental rate paid at the place of the Project.~~

...

~~§ 4.3.6 Unit prices, if any:~~

...

~~(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)~~

...

Item	Units and Limitations	Price per Unit (\$0.00)
------	-----------------------	-------------------------

...

~~§ 4.3.7 The Contractor shall prepare and submit to the Construction Manager, within 14 days of executing this Agreement, a written Control Estimate for the Owner's review and approval. The Control Estimate shall include the items in Section B.1 of Exhibit B, Determination of the Cost of the Work.~~

...

**§ 4.4 Cost of the Work Plus Contractor's Fee with a Guaranteed Maximum Price**

...

~~§ 4.4.1 The Cost of the Work is as defined in Exhibit B, Determination of the Cost of the Work.~~

...

~~§ 4.4.2 The Contractor's Fee:~~

...

~~(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee.)~~

...

~~§ 4.4.3 The method of adjustment of the Contractor's Fee for changes in the Work:~~

...

~~§ 4.4.4 Limitations, if any, on a Subcontractor's overhead and profit for increases in the cost of its portion of the Work:~~

...

~~§ 4.4.5 Rental rates for Contractor-owned equipment shall not exceed \_\_\_\_\_ percent (\_\_\_\_%) of the standard rental rate paid at the place of the Project.~~

...

~~§ 4.4.6 Unit Prices, if any:~~

...

~~(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)~~

...

Item	Units and Limitations	Price per Unit (\$0.00)
------	-----------------------	-------------------------

...

~~§ 4.4.7 Guaranteed Maximum Price~~

...

~~§ 4.4.7.1 The Contract Sum is guaranteed by the Contractor not to exceed (\$ ), subject to additions and deductions by Change Order as provided in the Contract Documents. This maximum sum is referred to in the Contract Documents as the Guaranteed Maximum Price. Costs which would cause the Guaranteed Maximum Price to be exceeded shall be paid by the Contractor without reimbursement by the Owner.~~

...

~~§ 4.4.7.2 Alternates~~

...

~~§ 4.4.7.2.1 Alternates, if any, included in the Guaranteed Maximum Price:~~

...

Item	Price
------	-------

...

~~§ 4.4.7.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.~~

...

*(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)*

...

Item	Price	Conditions for Acceptance
------	-------	---------------------------

...

~~§ 4.4.7.3 Allowances, if any, included in the Guaranteed Maximum Price:~~

...

*(Identify each allowance.)*

...

Item	Price
------	-------

...

~~§ 4.4.7.4 Assumptions, if any, upon which the Guaranteed Maximum Price is based:~~

...

*(Identify each assumption.)*

...

~~§ 4.4.8 To the extent that the Contract Documents are anticipated to require further development, the Guaranteed Maximum Price includes the costs attributable to such further development consistent with the Contract Documents and reasonably inferable therefrom. Such further development does not include changes in scope, systems, kinds and quality of materials, finishes, or equipment, all of which, if required, shall be incorporated by Change Order.~~

...

~~§ 4.4.9 The Owner shall authorize preparation of revisions to the Contract Documents that incorporate the agreed-upon assumptions contained in Section 4.4.7.4. The Owner shall promptly furnish such revised Contract Documents to the Contractor. The Contractor shall notify the Owner and Architect of any inconsistencies between the agreed-upon assumptions contained in Section 4.4.7.4 and the revised Contract Documents.~~

**PAGE 5**

None

...

None

...

**§ 5.1.3** Provided that an Application for Payment is received by the Construction Manager not later than the twenty-fifth day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the thirtieth day of the following month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment of the amount certified shall be made by the Owner not later than sixty-five ( 65 ) days after the Construction Manager receives the Application for Payment.

...

*(Federal, state or local laws may require payment within a certain period of time.)*

**PAGE 7**

**§ 5.1.6 Progress Payments Where the Contract Sum is Based on the Cost of the Work with a Guaranteed Maximum Price**

...

~~§ 5.1.6.1 With each Application for Payment, the Contractor shall submit payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached, and any other evidence required by the Owner, Construction Manager or Architect to demonstrate that payments already made by the Contractor on account of the Cost of the Work equal or exceed progress payments already received by the Contractor plus payrolls for the period covered by the present Application for Payment, less that portion of the progress payments attributable to the Contractor's Fee.~~

...

~~§ 5.1.6.2 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Guaranteed Maximum Price among: (1) the various portions of the Work; (2) any contingency for costs that are included in the Guaranteed Maximum Price but not otherwise allocated to another line item or included in a Change Order; and (3) the Contractor's Fee.~~

...

~~§ 5.1.6.2.1 The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Construction Manager and Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.~~

...

~~§ 5.1.6.2.2 The allocation of the Guaranteed Maximum Price under this Section 5.1.6.2 shall not constitute a separate guaranteed maximum price for the Cost of the Work of each individual line item in the schedule of values.~~

...

~~§ 5.1.6.2.3 When the Contractor allocates costs from a contingency to another line item in the schedule of values, the Contractor shall submit supporting documentation to the Architect and Construction Manager.~~

...

~~§ 5.1.6.3 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment. The percentage of completion shall be the lesser of (1) the percentage of that portion of the Work which has actually been completed; or (2) the percentage obtained by dividing (a) the expense that has actually been incurred by the Contractor on account of that portion of the Work and for which the Contractor has made payment or intends to make payment prior to the next Application for Payment by (b) the share of the Guaranteed Maximum Price allocated to that portion of the Work in the schedule of values.~~

...

~~§ 5.1.6.4 In accordance with AIA Document A232-2019, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:~~

...

~~§ 5.1.6.4.1 The amount of each progress payment shall first include:~~

...

- ~~1 That portion of the Guaranteed Maximum Price properly allocable to completed Work as determined by multiplying the percentage of completion of each portion of the Work by the share of the Guaranteed Maximum Price allocated to that portion of the Work in the most recent schedule of values;~~

...

~~.2 That portion of the Guaranteed Maximum Price properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction or, if approved in writing in advance by the Owner, suitably stored off the site at a location agreed upon in writing;~~

...

~~.3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified; and~~

...

~~.4 The Contractor's Fee, computed upon the Cost of the Work described in the preceding Sections 5.1.6.4.1.1 and 5.1.6.4.1.2 at the rate stated in Section 4.4.2 or, if the Contractor's Fee is stated as a fixed sum in that Section, an amount that bears the same ratio to that fixed sum fee as the Cost of the Work included in Sections 5.1.6.4.1.1 and 5.1.6.4.1.2 bears to a reasonable estimate of the probable Cost of the Work upon its completion.~~

...

**§ 5.1.6.4.2** The amount of each progress payment shall then be reduced by:

...

~~.1 The aggregate of any amounts previously paid by the Owner;~~

...

~~.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232-2019;~~

...

~~.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;~~

...

~~.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232-2019;~~

...

~~.5 The shortfall, if any, indicated by the Contractor in the documentation required by Section 5.1.6.1 to substantiate prior Applications for Payment, or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and~~

...

~~.6 Retainage withheld pursuant to Section 5.1.7.~~

...

~~§ 5.1.6.5 The Owner and the Contractor shall agree upon a mutually acceptable procedure for review and approval of payments to Subcontractors and the percentage of retainage held on Subcontracts, and the Contractor shall execute subcontracts in accordance with those agreements.~~

...

~~§ 5.1.6.6 In taking action on the Contractor's Applications for Payment, the Construction Manager and Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor and such action shall not be deemed to be a representation that (1) the Construction Manager or Architect have made a detailed examination, audit, or arithmetic verification of the documentation submitted in accordance with Section 5.1.6.1 or other supporting data; (2) that the Construction Manager or Architect have made exhaustive or continuous on-site inspections; or (3) that the Construction Manager or Architect have made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contract. Such examinations, audits, and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.~~

...

~~§ 5.1.6.7 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.~~

...

~~§ 5.1.6.8 If final completion of the Work is materially delayed through no fault of the Contractor, then the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A232-2019.~~

...

*(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)*

...

*(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)*

...

*(If the retainage established in Section 5.1.7.1 is to be modified prior to when the entire Work of this Contract is substantially complete, including modifications for completion of portions of the Work as provided in Section 3.4.2, insert provisions for such modifications.)*

...

*(Insert any other conditions for release of retainage when the Work of this Contract is substantially complete, or upon Substantial Completion of the Work of all Contractors on the Project or portions thereof.)*

...

See  
~~§ 5.2.2 Final Payment Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price~~5.1.3

~~§ 5.2.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when~~

...

~~.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A232-2019, and to satisfy other requirements, if any, which extend beyond final payment;~~

...

~~.2 the Contractor has submitted a final accounting for the Cost of the Work, pursuant to Exhibit B, Determination of the Cost of the Work and a final Application for Payment; and~~

...

~~.3 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect in accordance with Exhibit B, Determination of the Cost of the Work.~~

...

~~§ 5.2.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment, or as follows:~~ 5.2.1.3 Submit final paperwork:

...

~~§ 5.3 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.~~

...

*(Insert rate of interest agreed upon, if any.)*

...

Litigation in a court of competent jurisdiction.

...

Other: *(Specify)*

...

~~§ 7.2 Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price~~

...

**§ 7.2.1 Termination**

...

~~§ 7.2.1.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232-2019.~~

...

**~~§ 7.2.1.2 Termination by the Owner for Cause~~**

...

~~§ 7.2.1.2.1 If the Owner terminates the Contract for cause as provided in Article 14 of AIA Document A232-2019, the Owner shall then only pay the Contractor an amount as follows:~~

...

~~.1 Take the Cost of the Work incurred by the Contractor to the date of termination;~~

...

~~.2 Add the Contractor's Fee, computed upon the Cost of the Work to the date of termination at the rate stated in Section 4.3.2 or 4.4.2, as applicable, or, if the Contractor's Fee is stated as a fixed sum in that Section, an amount that bears the same ratio to that fixed sum Fee as the Cost of the Work at the time of termination bears to a reasonable estimate of the probable Cost of the Work upon its completion;~~

...

~~.3 Subtract the aggregate of previous payments made by the Owner; and~~

...

~~.4 Subtract the costs and damages incurred, or to be incurred, by the Owner under Article 14 of AIA Document A232-2019.~~

...

~~§ 7.2.1.2.2 When the Contract Sum is based on the Cost of the Work with a Guaranteed Maximum Price, if the Owner terminates the Contract for cause as provided in Article 14 of AIA Document A232-2019, the amount, if any, to be paid to the Contractor under Article 14 of AIA Document A232-2019 shall not cause the Guaranteed Maximum Price to be exceeded, nor shall it exceed the amount calculated in Section 7.2.1.2.1.~~

...

~~§ 7.2.1.2.3 The Owner shall also pay the Contractor fair compensation, either by purchase or rental at the election of the Owner, for any equipment owned by the Contractor that the Owner elects to retain and that is not otherwise included in the Cost of the Work under Section 7.2.1.2.1.1. To the extent that the Owner elects to take legal assignment of subcontracts and purchase orders (including rental agreements), the Contractor shall, as a condition of receiving the payments referred to in this Article 7, execute and deliver all such papers and take all such steps, including the legal assignment of such subcontracts and other contractual rights of the Contractor, as the Owner may require for the purpose of fully vesting in the Owner the rights and benefits of the Contractor under such subcontracts or purchase orders. All Subcontracts, purchase orders and rental agreements entered into by the Contractor will contain provisions allowing for assignment to the Owner as described above.~~

...

**§ 7.2.1.3 Termination by the Owner for Convenience**

...

If the Owner terminates the Contract for convenience in accordance with Article 14 of AIA Document A232-2019, then the Owner shall pay the Contractor a termination fee as follows:

...

*(Insert the amount of or method for determining the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)*

**PAGE 9**

*(Name, address, email address, and other information)*

...

*(Name, address, email address, and other information)*

...

**§ 8.5.1** The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A132™-2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

...

Certificate of Insurance – list Owner, Architect, and Construction Manager as additional insureds (does not apply to supplier only contracts). See General Conditions & Supplementary Conditions for limits. Worker's Compensation in state of project (does not apply to supplier only

...

§-contracts).

...

**§ 8.5.2** The Contractor shall provide bonds as set forth in AIA Document A132™-2019, Exhibit A, and elsewhere in the Contract Documents.

...

**§ 8.6** Notice in electronic format, pursuant to Article 1 of AIA Document A232-2019, may be given in accordance with AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

...

*(If other than in accordance with AIA Document E203-2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)*

...

~~.2~~ AIA Document A132™-2019, ~~Exhibit A~~, Insurance and Bonds Exhibit

PAGE 10

~~.4~~ AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:

...

*(Insert the date of the E203-2013 incorporated into this Agreement.)*

...

~~.5~~ .4 Drawings

...

Exhibit 1

...

~~.6~~ .5 Specifications

...

Exhibit 2

...

~~.7~~ .6 Addenda, if any:

...

~~.8~~ .7 Other Exhibits:

...

*(Check all boxes that apply and include appropriate information identifying the exhibit where required.)*

...

AIA Document A132™-2019, ~~Exhibit B~~, Determination of the Cost of the ~~Work~~ Work, Bid Form

...

AIA Document E235™-2019, Sustainable Projects Exhibit, Construction Manager as Adviser Edition, dated as indicated below:

...

*(Insert the date of the E235-2019 incorporated into this Agreement.)*

...

The Sustainability Plan:

...

Title	Date	Pages
-------	------	-------

...

Supplementary and other Conditions of the Contract:

...

<u>See Specifications, Exhibit 2</u>	<u>General Conditions &amp; Supplementary Conditions</u>	
--------------------------------------	--	--

...

~~0~~ 8 Other documents, if any, listed below:

...

*(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A232-2019 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)*

**Certification of Document's Authenticity**

**AIA® Document D401™ – 2003**

I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 12:22:53 ET on 04/07/2021 under Order No. 5531360427 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A132™ - 2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

\_\_\_\_\_

*(Signed)*

\_\_\_\_\_

*(Title)*

\_\_\_\_\_

*(Dated)*

**SECTION 00 7200  
GENERAL CONDITIONS**

**PART 1 GENERAL**

**1.01 FORM OF GENERAL CONDITIONS**

- A. Construction Manager as Advisor
  - 1. AIA Document A232 - 2019 (Articles 1 through 15, inclusive) General Conditions of the Contract for Construction, Construction Manager as Adviser Edition shall be made a part of these Contract Documents.

**1.02 THE GENERAL CONDITIONS APPLICABLE TO THIS CONTRACT IS ATTACHED FOLLOWING THIS PAGE.**

**1.03 RELATED REQUIREMENTS**

- A. SECTION 00 7300 - Supplementary Conditions.
- B. SECTION 01 4216 - Definitions.

**1.04 SUPPLEMENTARY CONDITIONS**

- A. REFER TO DOCUMENT 00 7300 - Supplementary Conditions FOR AMENDMENTS TO THESE GENERAL CONDITIONS.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**

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# AIA<sup>®</sup> Document A232<sup>™</sup> – 2019

## **General Conditions of the Contract for Construction, Construction Manager as Adviser Edition**

for the following PROJECT:  
*(Name, and location or address)*

**THE CONSTRUCTION MANAGER:**  
*(Name, legal status, and address)*

**THE OWNER:**  
*(Name, legal status, and address)*

**THE ARCHITECT:**  
*(Name, legal status, and address)*

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Documents A132<sup>™</sup>-2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition; B132<sup>™</sup>-2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132<sup>™</sup>-2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser.

### TABLE OF ARTICLES

1	GENERAL PROVISIONS
2	OWNER
3	CONTRACTOR
4	ARCHITECT AND CONSTRUCTION MANAGER
5	SUBCONTRACTORS
6	CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
7	CHANGES IN THE WORK
8	TIME
9	PAYMENTS AND COMPLETION
10	PROTECTION OF PERSONS AND PROPERTY
11	INSURANCE AND BONDS
12	UNCOVERING AND CORRECTION OF WORK
13	MISCELLANEOUS PROVISIONS
14	TERMINATION OR SUSPENSION OF THE CONTRACT
15	CLAIMS AND DISPUTES

## ARTICLE 1 GENERAL PROVISIONS

### § 1.1 Basic Definitions

**§ 1.1.1 The Contract Documents.** The Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of addenda relating to bidding or proposal requirements.

**§ 1.1.2 The Contract.** The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and the Construction Manager or the Construction Manager's consultants, (3) between the Owner and the Architect or the Architect's consultants, (4) between the Contractor and the Construction Manager or the Construction Manager's consultants, (5) between the Owner and a Subcontractor or Sub-subcontractor (6) between the Construction Manager and the Architect, or (7) between any persons or entities other than the Owner and Contractor. The Construction Manager and Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of their duties.

**§ 1.1.3 The Work.** The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

**§ 1.1.4 The Project.** The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by other Contractors, and by the Owner's own forces and Separate Contractors.

**§ 1.1.5 Contractors.** Contractors are persons or entities, other than the Contractor or Separate Contractors, who perform Work under contracts with the Owner that are administered by the Architect and Construction Manager.

**§ 1.1.6 Separate Contractors.** Separate Contractors are persons or entities who perform construction under separate contracts with the Owner not administered by the Architect and Construction Manager.

**§ 1.1.7 The Drawings.** The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

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

**§ 1.1.9 Instruments of Service.** Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

**§ 1.1.10 Initial Decision Maker.** The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

### § 1.2 Correlation and Intent of the Contract Documents

**§ 1.2.1** The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as

binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

**§ 1.2.1.1** The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

**§ 1.2.2** Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

**§ 1.2.3** Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

### **§ 1.3 Capitalization**

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

### **§ 1.4 Interpretation**

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

### **§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service**

**§ 1.5.1** The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

**§ 1.5.2** The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

### **§ 1.6 Notice**

**§ 1.6.1** Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

**§ 1.6.2** Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

### **§ 1.7 Digital Data Use and Transmission**

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

### **§ 1.8 Building Information Models Use and Reliance**

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

## **ARTICLE 2 OWNER**

### **§ 2.1 General**

**§ 2.1.1** The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Construction Manager and the Architect do not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

**§ 2.1.2** The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

### **§ 2.2 Evidence of the Owner's Financial Arrangements**

**§ 2.2.1** Prior to commencement of the Work, and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

**§ 2.2.2** Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

**§ 2.2.3** After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

**§ 2.2.4** Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

### **§ 2.3 Information and Services Required of the Owner**

**§ 2.3.1** Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities. Unless otherwise provided under the Contract Documents, the Owner, assisted by the Construction Manager, shall secure and pay for the building permit.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 The Owner shall retain a construction manager adviser lawfully practicing construction management in the jurisdiction where the Project is located. That person or entity is identified as the Construction Manager in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.4 If the employment of the Construction Manager or Architect terminates, the Owner shall employ a successor construction manager or architect to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Construction Manager or Architect, respectively.

§ 2.3.5 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.6 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.7 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.3.8 The Owner shall forward all communications to the Contractor through the Construction Manager. Other communication shall be made as set forth in Section 4.2.6.

#### § 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

#### § 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to review by the Construction Manager and prior approval of the Architect, and the Construction Manager or Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Construction Manager's and Architect's and their respective consultants' additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

### ARTICLE 3 CONTRACTOR

#### § 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Construction Manager or Architect in their administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

### § 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.5, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Construction Manager and Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information submitted to the Construction Manager in such form as the Construction Manager and Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Construction Manager and Architect any nonconformity discovered by or made known to the Contractor as a request for information submitted to Construction Manager in such form as the Construction Manager and Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

### § 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner, the Construction Manager, and the Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. The Construction Manager shall review the proposed alternative for sequencing, constructability, and coordination impacts on the other Contractors. Unless the Architect or the Construction Manager objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of the Project already performed to determine that such portions are in proper condition to receive subsequent Work.

### § 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect, in consultation with the Construction Manager, and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

### § 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner, Construction Manager, and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Construction Manager or Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

### § 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work or portions thereof provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

### § 3.7 Permits, Fees, Notices, and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Owner, assisted by the Construction Manager, shall secure and pay for the building permit. The Contractor shall secure and pay for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 **Concealed or Unknown Conditions.** If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner, Construction Manager, and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect and Construction Manager will promptly investigate such conditions and, if the Architect, in consultation with the Construction Manager, determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect, in consultation with the Construction Manager, determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of

the Contract is justified, the Architect shall promptly notify the Owner, Construction Manager, and Contractor, stating the reasons. If the Owner or Contractor disputes the Architect's determination or recommendation, either party may submit a Claim as provided in Article 15.

**§ 3.7.5** If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner, Construction Manager, and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

### **§ 3.8 Allowances**

**§ 3.8.1** The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

**§ 3.8.2** Unless otherwise provided in the Contract Documents:

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

**§ 3.8.3** Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

### **§ 3.9 Superintendent**

**§ 3.9.1** The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

**§ 3.9.2** The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect, through the Construction Manager, of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Construction Manager may notify the Contractor, stating whether the Owner, the Construction Manager, or the Architect (1) has reasonable objection to the proposed superintendent or (2) require additional time for review. Failure of the Construction Manager to provide notice within the 14-day period shall constitute notice of no reasonable objection.

**§ 3.9.3** The Contractor shall not employ a proposed superintendent to whom the Owner, Construction Manager, or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

### **§ 3.10 Contractor's Construction and Submittal Schedules**

**§ 3.10.1** The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information, and the Construction Manager's use in developing the Project schedule, a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. The Contractor shall cooperate with the Construction Manager in scheduling and performing the Contractor's Work to avoid conflict with, and as to cause no delay in, the work or activities of other Contractors, or the construction or operations of the Owner's own forces or Separate Contractors.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Construction Manager's and Architect's approval. The Architect and Construction Manager's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Construction Manager and Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall participate with other Contractors, the Construction Manager, and the Owner in reviewing and coordinating all schedules for incorporation into the Project schedule that is prepared by the Construction Manager. The Contractor shall make revisions to the construction schedule and submittal schedule as deemed necessary by the Construction Manager to conform to the Project schedule.

§ 3.10.4 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner, Construction Manager, and Architect, and incorporated into the approved Project schedule.

### § 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Construction Manager, Architect, and Owner, and delivered to the Construction Manager for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

### § 3.12 Shop Drawings, Product Data, and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

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

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect and Construction Manager is subject to the limitations of Sections 4.2.10 through 4.2.12. Informational submittals upon which the Construction Manager and Architect are not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Construction Manager or Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Construction Manager, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the Project submittal schedule approved by the Construction Manager and Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of other Contractors, Separate Contractors, or the Owner's own forces. The Contractor shall cooperate with the Construction Manager in the coordination of the Contractor's Shop Drawings, Product Data, Samples, and similar submittals with related documents submitted by other Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner, Construction Manager, and Architect, that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been reviewed and approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Construction Manager and Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Construction Manager and Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner, the Architect, and the Construction Manager shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Construction Manager shall review submittals for sequencing, constructability, and coordination impacts on other Contractors.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Construction Manager and Architect at the time and in the form specified by the Architect.

### § 3.13 Use of Site

§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.13.2 The Contractor shall coordinate the Contractor's operations with, and secure the approval of, the Construction Manager before using any portion of the site.

### § 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner, Separate Contractors, or of other Contractors by cutting, patching, or otherwise altering such

construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner, Separate Contractors, or by other Contractors except with written consent of the Construction Manager, Owner, and such other Contractors or Separate Contractors. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Separate Contractors, other Contractors, or the Owner, its consent to cutting or otherwise altering the Work.

### **§ 3.15 Cleaning Up**

**§ 3.15.1** The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

**§ 3.15.2** If the Contractor fails to clean up as provided in the Contract Documents, the Owner, or Construction Manager with the Owner's approval, may do so and the Owner shall be entitled to reimbursement from the Contractor.

### **§ 3.16 Access to Work**

The Contractor shall provide the Owner, Construction Manager, and Architect with access to the Work in preparation and progress wherever located.

### **§ 3.17 Royalties, Patents and Copyrights**

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner, Construction Manager, and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner, Architect, or Construction Manager. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect through the Construction Manager.

### **§ 3.18 Indemnification**

**§ 3.18.1** To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Construction Manager, Architect, Construction Manager's and Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

**§ 3.18.2** In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

## **ARTICLE 4 ARCHITECT AND CONSTRUCTION MANAGER**

### **§ 4.1 General**

**§ 4.1.1** The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

**§ 4.1.2** The Construction Manager is the person or entity retained by the Owner pursuant to Section 2.3.3 and identified as such in the Agreement.

**§ 4.1.3** Duties, responsibilities, and limitations of authority of the Construction Manager and Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Construction Manager, Architect, and Contractor. Consent shall not be unreasonably withheld.

## § 4.2 Administration of the Contract

§ 4.2.1 The Construction Manager and Architect will provide administration of the Contract as described in the Contract Documents and will be the Owner's representatives during construction until the date the Architect issues the final Certificate for Payment. The Construction Manager and Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of the site visits, the Architect will keep the Owner and the Construction Manager reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner and Construction Manager known deviations from the Contract Documents and defects and deficiencies observed in the Work.

§ 4.2.3 The Construction Manager shall provide one or more representatives who shall be in attendance at the Project site whenever the Work is being performed. The Construction Manager will determine in general if the Work observed is being performed in accordance with the Contract Documents, will keep the Owner and Architect reasonably informed of the progress of the Work, and will promptly report to the Owner and Architect known deviations from the Contract Documents and the most recent Project schedule, and defects and deficiencies observed in the Work.

§ 4.2.4 The Construction Manager will schedule and coordinate the activities of the Contractor and other Contractors in accordance with the latest approved Project schedule.

§ 4.2.5 The Construction Manager, except to the extent required by Section 4.2.4, and Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, and neither will be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. Neither the Construction Manager nor the Architect will have control over or charge of, or be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or of any other persons or entities performing portions of the Work.

§ 4.2.6 **Communications.** The Owner shall communicate with the Contractor and the Construction Manager's consultants through the Construction Manager about matters arising out of or relating to the Contract Documents. The Owner and Construction Manager shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Construction Manager otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with other Contractors shall be through the Construction Manager. Communications by and with the Owner's own forces and Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.7 The Construction Manager and Architect will review and certify all Applications for Payment by the Contractor, in accordance with the provisions of Article 9.

§ 4.2.8 The Architect and Construction Manager have authority to reject Work that does not conform to the Contract Documents, and will notify each other about the rejection. Whenever the Construction Manager considers it necessary or advisable, the Construction Manager will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, upon written authorization of the Owner, whether or not the Work is fabricated, installed or completed. The foregoing authority of the Construction Manager will be subject to the provisions of Sections 4.2.18 through 4.2.20 inclusive, with respect to interpretations and decisions of the Architect. However, neither the Architect's nor the Construction Manager's authority to act under this Section 4.2.8 nor a decision made by either of them in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect or the Construction Manager to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons performing any of the Work.

§ 4.2.9 Utilizing the submittal schedule provided by the Contractor, the Construction Manager shall prepare, and revise as necessary, a Project submittal schedule incorporating information from other Contractors, the Owner, Owner's

consultants, Owner's Separate Contractors and vendors, governmental agencies, and participants in the Project under the management of the Construction Manager. The Project submittal schedule and any revisions shall be submitted to the Architect for approval.

**§ 4.2.10** The Construction Manager will receive and promptly review for conformance with the submittal requirements of the Contract Documents, all submittals from the Contractor such as Shop Drawings, Product Data, and Samples. Where there are other Contractors, the Construction Manager will also check and coordinate the information contained within each submittal received from the Contractor and other Contractors, and transmit to the Architect those recommended for approval. By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Construction Manager represents to the Owner and Architect that the Construction Manager has reviewed and recommended them for approval. The Construction Manager's actions will be taken in accordance with the Project submittal schedule approved by the Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness while allowing sufficient time to permit adequate review by the Architect.

**§ 4.2.11** The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Upon the Architect's completed review, the Architect shall transmit its submittal review to the Construction Manager.

**§ 4.2.12** Review of the Contractor's submittals by the Construction Manager and Architect is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Construction Manager and Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Construction Manager and Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

**§ 4.2.13** The Construction Manager will prepare Change Orders and Construction Change Directives.

**§ 4.2.14** The Construction Manager and the Architect will take appropriate action on Change Orders or Construction Change Directives in accordance with Article 7, and the Architect will have authority to order minor changes in the Work as provided in Section 7.4. The Architect, in consultation with the Construction Manager, will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

**§ 4.2.15** Utilizing the documents provided by the Contractor, the Construction Manager will maintain at the site for the Owner one copy of all Contract Documents, approved Shop Drawings, Product Data, Samples, and similar required submittals, in good order and marked currently to record all changes and selections made during construction. These will be available to the Architect and the Contractor, and will be delivered to the Owner upon completion of the Project.

**§ 4.2.16** The Construction Manager will assist the Architect in conducting inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion in conjunction with the Architect pursuant to Section 9.8; and receive and forward to the Owner written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10. The Construction Manager will forward to the Architect a final Application and Certificate for Payment or final Project Application and Project Certificate for Payment upon the Contractor's compliance with the requirements of the Contract Documents.

**§ 4.2.17** If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Construction Manager of any change in the duties, responsibilities and limitations of authority of the Project representatives.

**§ 4.2.18** The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of the Construction Manager, Owner, or Contractor through the Construction Manager. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.19 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions so rendered in good faith.

§ 4.2.20 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.21 The Construction Manager will receive and review requests for information from the Contractor, and forward each request for information to the Architect, with the Construction Manager's recommendation. The Architect will review and respond in writing, through the Construction Manager, to requests for information about the Contract Documents. The Construction Manager's recommendation and the Architect's response to each request will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

## ARTICLE 5 SUBCONTRACTORS

### § 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include other Contractors or Separate Contractors or the subcontractors of other Contractors or Separate Contractors.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

### § 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Construction Manager, for review by the Owner, Construction Manager and Architect, of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Construction Manager may notify the Contractor whether the Owner, the Construction Manager or the Architect (1) has reasonable objection to any such proposed person or entity or, (2) requires additional time for review. Failure of the Construction Manager to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner, Construction Manager or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner, Construction Manager or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner, Construction Manager or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner, Construction Manager or Architect makes reasonable objection to such substitution.

### § 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, that the Contractor, by these Contract Documents, assumes toward the Owner, Construction Manager and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner, Construction Manager and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically

provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

#### **§ 5.4 Contingent Assignment of Subcontracts**

**§ 5.4.1** Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

**§ 5.4.2** Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

**§ 5.4.3** Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor Contractor or other entity. If the Owner assigns the subcontract to a successor Contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor Contractor's obligations under the subcontract.

### **ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS**

#### **§ 6.1 Owner's Right to Perform Construction with Own Forces and to Award Other Contracts**

**§ 6.1.1** The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

**§ 6.1.2** When the Owner performs construction or operations with the Owner's own forces or Separate Contractors, the Owner shall provide for coordination of such forces and Separate Contractors with the Work of the Contractor, who shall cooperate with them.

**§ 6.1.3** Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

#### **§ 6.2 Mutual Responsibility**

**§ 6.2.1** The Contractor shall afford the Owner's own forces, Separate Contractors, Construction Manager and other Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

**§ 6.2.2** If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner's own forces, Separate Contractors or other Contractors, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Construction Manager and Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor or other Contractors that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Construction Manager and the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's or other Contractors' completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for

discrepancies or defects in the construction or operations by the Owner or Separate Contractors or other Contractors that are not apparent.

**§ 6.2.3** The Contractor shall reimburse the Owner for costs the Owner incurs, including costs that are payable to a Separate Contractors or to other Contractors, because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of delays, improperly timed activities, damage to the Work or defective construction by the Owner's own forces, Separate Contractors, or other Contractors.

**§ 6.2.4** The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction, or to property of the Owner, Separate Contractors, or other Contractors as provided in Section 10.2.5.

**§ 6.2.5** The Owner, Separate Contractors, and other Contractors shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

### **§ 6.3 Owner's Right to Clean Up**

If a dispute arises among the Contractor, Separate Contractors, other Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Construction Manager, with notice to the Architect, will allocate the cost among those responsible.

## **ARTICLE 7 CHANGES IN THE WORK**

### **§ 7.1 General**

**§ 7.1.1** Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

**§ 7.1.2** A Change Order shall be based upon agreement among the Owner, Construction Manager, Architect and Contractor. A Construction Change Directive requires agreement by the Owner, Construction Manager and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

**§ 7.1.3** Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

### **§ 7.2 Change Orders**

A Change Order is a written instrument prepared by the Construction Manager and signed by the Owner, Construction Manager, Architect, and Contractor, stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

### **§ 7.3 Construction Change Directives**

**§ 7.3.1** A Construction Change Directive is a written order prepared by the Construction Manager and signed by the Owner, Construction Manager and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

**§ 7.3.2** A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

**§ 7.3.3** If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;

- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Construction Manager shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Construction Manager may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Construction Manager and Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Construction Manager of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Construction Manager and Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Construction Manager and Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Construction Manager and Architect determine to be reasonably justified. The interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Construction Manager and Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Construction Manager shall prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

#### § 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Construction Manager and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor

change without prior notice to the Construction Manager that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

## **ARTICLE 8 TIME**

### **§ 8.1 Definitions**

**§ 8.1.1** Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

**§ 8.1.2** The date of commencement of the Work is the date established in the Agreement.

**§ 8.1.3** The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

**§ 8.1.4** The term “day” as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

### **§ 8.2 Progress and Completion**

**§ 8.2.1** Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

**§ 8.2.2** The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

**§ 8.2.3** The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

### **§ 8.3 Delays and Extensions of Time**

**§ 8.3.1** If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner, Architect, Construction Manager, or an employee of any of them, or of the Owner’s own forces, Separate Contractors, or other Contractors; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor’s control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts and the Architect, based on the recommendation of the Construction Manager, determines justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

**§ 8.3.2** Claims relating to time shall be made in accordance with applicable provisions of Article 15.

**§ 8.3.3** This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

## **ARTICLE 9 PAYMENTS AND COMPLETION**

### **§ 9.1 Contract Sum**

**§ 9.1.1** The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

**§ 9.1.2** If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

### **§ 9.2 Schedule of Values**

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Construction Manager, before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Construction Manager and the Architect. This schedule, unless objected to by the Construction Manager or Architect, shall be used as a basis for reviewing the Contractor’s Applications for Payment. The Construction Manager shall forward to the Architect the Contractor’s schedule of values. Any changes to the schedule of values shall be submitted to the Construction Manager and supported by such data to substantiate its

accuracy as the Construction Manager and the Architect may require, and unless objected to by the Construction Manager or the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

### **§ 9.3 Applications for Payment**

**§ 9.3.1** At least fifteen days before the date established for each progress payment, the Contractor shall submit to the Construction Manager an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner, Construction Manager or Architect require, such as copies of requisitions, and releases of waivers of lien from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

**§ 9.3.1.1** As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Construction Manager and Architect, but not yet included in Change Orders.

**§ 9.3.1.2** Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

**§ 9.3.2** Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

**§ 9.3.3** The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials and equipment relating to the Work.

### **§ 9.4 Certificates for Payment**

**§ 9.4.1** Where there is only one Contractor, the Construction Manager will, within seven days after the Construction Manager's receipt of the Contractor's Application for Payment, review the Application, certify the amount the Construction Manager determines is due the Contractor, and forward the Contractor's Application and Certificate for Payment to the Architect. Within seven days after the Architect receives the Contractor's Application for Payment from the Construction Manager, the Architect will either (1) issue to the Owner a Certificate for Payment, in the full amount of the Application for Payment, with a copy to the Construction Manager; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Construction Manager and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Construction Manager and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1. The Construction Manager will promptly forward to the Contractor the Architect's notice of withholding certification.

**§ 9.4.2** Where there is more than one Contractor performing portions of the Project, the Construction Manager will, within seven days after the Construction Manager receives all of the Contractors' Applications for Payment: (1) review the Applications and certify the amount the Construction Manager determines is due each of the Contractors; (2) prepare a Summary of Contractors' Applications for Payment by combining information from each Contractor's application with information from similar applications for progress payments from the other Contractors; (3) prepare a Project Application and Certificate for Payment; (4) certify the amount the Construction Manager determines is due all Contractors; and (5) forward the Summary of Contractors' Applications for Payment and Project Application and Certificate for Payment to the Architect.

**§ 9.4.2.1** Within seven days after the Architect receives the Project Application and Project Certificate for Payment and the Summary of Contractors' Applications for Payment from the Construction Manager, the Architect will either (1)

issue to the Owner a Project Certificate for Payment, with a copy to the Construction Manager; or (2) issue to the Owner a Project Certificate for Payment for such amount as the Architect determines is properly due, and notify the Construction Manager and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Project Application for Payment, and notify the Construction Manager and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1. The Construction Manager will promptly forward the Architect's notice of withholding certification to the Contractors.

**§ 9.4.3** The Construction Manager's certification of an Application for Payment or, in the case of more than one Contractor, a Project Application and Certificate for Payment, shall be based upon the Construction Manager's evaluation of the Work and the data in the Application or Applications for Payment. The Construction Manager's certification will constitute a representation that, to the best of the Construction Manager's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is, or Contractors are, entitled to payment in the amount certified.

**§ 9.4.4** The Architect's issuance of a Certificate for Payment or, in the case of more than one Contractor, Project Application and Certificate for Payment, shall be based upon the Architect's evaluation of the Work, the recommendation of the Construction Manager, and data in the Application for Payment or Project Application for Payment. The Architect's certification will constitute a representation that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is, or Contractors are, entitled to payment in the amount certified.

**§ 9.4.5** The representations made pursuant to Sections 9.4.3 and 9.4.4 are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Construction Manager or Architect.

**§ 9.4.6** The issuance of a Certificate for Payment or a Project Certificate for Payment will not be a representation that the Construction Manager or Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

#### **§ 9.5 Decisions to Withhold Certification**

**§ 9.5.1** The Construction Manager or Architect may withhold a Certificate for Payment or Project Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Construction Manager's or Architect's opinion the representations to the Owner required by Section 9.4.3 and 9.4.4 cannot be made. If the Construction Manager or Architect is unable to certify payment in the amount of the Application, the Construction Manager will notify the Contractor and Owner as provided in Section 9.4.1 and 9.4.2. If the Contractor, Construction Manager and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment or a Project Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Construction Manager or Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment or Project Certificate for Payment previously issued, to such extent as may be necessary in the Construction Manager's or Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from the acts and omissions described in Section 3.3.2 because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor or other Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect or Construction Manager withholds certification for payment under Section 9.5.1, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Construction Manager, and both will reflect such payment on the next Certificate for Payment.

#### § 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment or Project Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Construction Manager and Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Construction Manager will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Owner, Construction Manager and Architect on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner, Construction Manager nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

#### § 9.7 Failure of Payment

If the Construction Manager and Architect do not issue a Certificate for Payment or a Project Certificate for Payment, through no fault of the Contractor, within fourteen days after the Construction Manager's receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the

Contract Documents, the amount certified by the Construction Manager and Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner, Construction Manager and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

#### **§ 9.8 Substantial Completion**

**§ 9.8.1** Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use.

**§ 9.8.2** When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall notify the Construction Manager, and the Contractor and Construction Manager shall jointly prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

**§ 9.8.3** Upon receipt of the list, the Architect, assisted by the Construction Manager, will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect, assisted by the Construction Manager, to determine Substantial Completion.

**§ 9.8.4** When the Architect, assisted by the Construction Manager, determines that the Work of all of the Contractors, or designated portion thereof, is substantially complete, the Construction Manager will prepare, and the Construction Manager and Architect shall execute, a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

**§ 9.8.5** The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

#### **§ 9.9 Partial Occupancy or Use**

**§ 9.9.1** The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor and Construction Manager shall jointly prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect after consultation with the Construction Manager.

**§ 9.9.2** Immediately prior to such partial occupancy or use, the Owner, Construction Manager, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

**§ 9.9.3** Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

### **§ 9.10 Final Completion and Final Payment**

**§ 9.10.1** Upon completion of the Work, the Contractor shall forward to the Construction Manager a notice that the Work is ready for final inspection and acceptance, and shall also forward to the Construction Manager a final Contractor's Application for Payment. Upon receipt, the Construction Manager shall perform an inspection to confirm the completion of Work of the Contractor. The Construction Manager shall make recommendations to the Architect when the Work of all of the Contractors is ready for final inspection, and shall then forward the Contractors' notices and Application for Payment or Project Application for Payment, to the Architect, who will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Construction Manager and Architect will promptly issue a final Certificate for Payment or Project Certificate for Payment stating that to the best of their knowledge, information and belief, and on the basis of their on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Construction Manager's and Architect's final Certificate for Payment or Project Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

**§ 9.10.2** Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect through the Construction Manager (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

**§ 9.10.3** If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Construction Manager and Architect so confirm, the Owner shall, upon application by the Contractor and certification by the Construction Manager and Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect through the Construction Manager prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

**§ 9.10.4** The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

**§ 9.10.5** Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

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

### **§ 10.1 Safety Precautions and Programs**

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall submit the Contractor's safety program to the Construction Manager for review and coordination with the safety programs of other Contractors. The Construction Manager's responsibilities for review and coordination of safety programs shall not extend to direct control over or charge of the acts or omissions of the Contractors, Subcontractors, agents or employees of the Contractors or

Subcontractors, or any other persons performing portions of the Work and not directly employed by the Construction Manager.

## **§ 10.2 Safety of Persons and Property**

**§ 10.2.1** The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor;
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction; and
- .4 construction or operations by the Owner, Separate Contractors, or other Contractors.

**§ 10.2.2** The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

**§ 10.2.3** The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

**§ 10.2.4** When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

**§ 10.2.5** The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner, Construction Manager or Architect or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

**§ 10.2.6** The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner, Construction Manager and Architect.

**§ 10.2.7** The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

### **§ 10.2.8 Injury or Damage to Person or Property**

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

## **§ 10.3 Hazardous Materials**

**§ 10.3.1** The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner, Construction Manager and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor, Construction Manager and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor, the Construction Manager and the Architect will promptly reply to the Owner in writing stating whether or not any of them has reasonable objection to the persons or entities proposed by the Owner. If the Contractor, Construction Manager or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor, the Construction Manager and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Construction Manager, Architect, their consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

#### § 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

### ARTICLE 11 INSURANCE AND BONDS

#### § 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Construction Manager and Construction Manager's consultants, and the Architect and Architect's consultants, shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 **Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice directly to the Owner, and separately to the Construction Manager, of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

#### § 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 **Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform both the Contractor and the Construction Manager, separately and in writing, prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 **Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice directly to the Contractor, and separately to the Construction Manager, of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

#### § 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Construction Manager and Construction Manager's consultants; (3) the Architect and Architect's consultants; (4) other Contractors and any of their subcontractors, sub-subcontractors, agents, and employees; and (5) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Construction Manager, Construction Manager's consultants, Architect, Architect's consultants, other Contractors, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this Section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

#### § 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor, Architect, and Construction Manager for loss of use of the Owner's property, due to fire or other hazards however caused.

#### § 11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Construction Manager, Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Construction Manager, Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

### ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

#### § 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Construction Manager's or Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by either, be uncovered for their examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Construction Manager or Architect has not specifically requested to examine prior to its being covered, the Construction Manager or Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

#### § 12.2 Correction of Work

##### § 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Construction Manager or Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion, and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Construction Manager's and Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

##### § 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the

Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner, Construction Manager or Architect, the Owner may correct it in accordance with Section 2.5.

**§ 12.2.2.2** The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

**§ 12.2.2.3** The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

**§ 12.2.3** The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

**§ 12.2.4** The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner, Separate Contractors, or other Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

**§ 12.2.5** Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

**§ 12.3 Acceptance of Nonconforming Work**

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

**ARTICLE 13 MISCELLANEOUS PROVISIONS**

**§ 13.1 Governing Law**

The Contract shall be governed by the law of the place where the Project is located excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

**§ 13.2 Successors and Assigns**

**§ 13.2.1** The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

**§ 13.2.2** The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

**§ 13.3 Rights and Remedies**

**§ 13.3.1** Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Construction Manager, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

#### § 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Construction Manager and Architect timely notice of when and where tests and inspections are to be made so that the Construction Manager and Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Construction Manager, Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Construction Manager and Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Construction Manager and Architect of when and where tests and inspections are to be made so that the Construction Manager and Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Construction Manager's and Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Construction Manager for transmittal to the Architect.

§ 13.4.5 If the Construction Manager or Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Construction Manager or Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

#### § 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

### ARTICLE 14. TERMINATION OR SUSPENSION OF THE CONTRACT

#### § 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Construction Manager has not certified or the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner, Construction Manager and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees, or any other persons performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner, Construction Manager and Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

#### § 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, after consultation with the Construction Manager, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Construction Manager's and Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall, upon application, be certified by the Initial Decision Maker after consultation with the Construction Manager, and this obligation for payment shall survive termination of the Contract.

#### § 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and the Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent:

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of this Contract.

**§ 14.4 Termination by the Owner for Convenience**

**§ 14.4.1** The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

**§ 14.4.2** Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

**§ 14.4.3** In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

**ARTICLE 15 CLAIMS AND DISPUTES**

**§ 15.1 Claims**

**§ 15.1.1 Definition.** A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

**§ 15.1.2 Time Limits on Claims**

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

**§ 15.1.3 Notice of Claims**

**§ 15.1.3.1** Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Construction Manager and Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

**§ 15.1.3.2** Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

**§ 15.1.4 Continuing Contract Performance**

**§ 15.1.4.1** Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

**§ 15.1.4.2** The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

**§ 15.1.5 Claims for Additional Cost.** If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

**§ 15.1.6 Claims for Additional Time**

**§ 15.1.6.1** If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay only one Claim is necessary.

**§ 15.1.6.2** If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

**§ 15.1.7 Waiver of Claims for Consequential Damages.** The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

**§ 15.2 Initial Decision**

**§ 15.2.1** Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

**§ 15.2.2** The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

**§ 15.2.3** In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

**§ 15.2.4** If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

**§ 15.2.5** The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties, the Construction Manager, and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days of receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

### § 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

### § 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

**§ 15.4.4 Consolidation or Joinder**

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

Sample

**SECTION 00 7300  
SUPPLEMENTARY CONDITIONS**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. These Supplementary Conditions amend and supplement the General Conditions defined in Document 00 7200 - General Conditions and other provisions of Contract Documents as indicated below. Provisions that are not so amended or supplemented remain in full force and effect.
- B. The terms used in these Supplementary Conditions that are defined in the General Conditions have the meanings assigned to them in the General Conditions.

**1.02 MODIFICATIONS TO GENERAL CONDITIONS APPLICABLE TO THIS CONTRACT ARE ATTACHED FOLLOWING THIS PAGE.**

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

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## SECTION 00 7300

### ARTICLE 16. SUPPLEMENTARY CONDITIONS

#### PART 1 GENERAL

The following supplements modify, change, delete from, or add to the "General Conditions of the Contract for Construction, Construction Manager as Advisor Edition," AIA Document A232 - 2019. Where any article of the General Conditions is modified or any paragraph, subparagraph or clause thereof or deleted by these Supplementary Conditions, the unaltered provisions of the Article, Paragraph, Subparagraph or clause shall remain in effect.

#### ARTICLE 1 - GENERAL PROVISIONS

##### 1.1 Basic Definitions

**1.1.1** The Contract Documents: Add as part of Contract Documents: Performance Bond or Performance-Labor Material Bond, if required; Contractor's Bid.

##### 1.2 Correlation and Intent of the Contract Documents

**1.2.1** Add at the end of first sentence: --; in proper operating condition.

**1.2.2** At the end of the last sentence, add the following: --, unless it is specified that a subcontract include specific phases or elements to complete a certain part of the work for reasons of coordination or responsibility. Where the specification has been divided into sections, it is for convenience in use. The architect assumes no responsibility for proper placement of phases of the work into the proper division or section nor the arrangement of work shown on the drawings. The architect shall not be obligated to enter into jurisdictional or other disputes as a result of the organization, arrangement or location of parts of the work in specifications or on drawings, nor to serve as arbiter to establish subcontract limits. Unless otherwise specified, the scope of work of each section shall be to furnish labor, materials, equipment, skill, erection, installation, services and related items for the phase of work of that section, as required by the drawings, as specified or as otherwise required to provide and complete the entire work of the section.

**1.2.4** Add subparagraph: The general character and scope of the work is called for by the contract documents. Where a portion of the work is fully drawn and the remainder is merely indicated, the portion fully drawn shall apply to all similar parts of the work. Drawings intended primarily as information for one trade may not necessarily show the work of other trades, which shall not be construed, as there being no related materials or adjacent work.

**1.2.5** Add subparagraph: Figured dimensions shall be followed in preference to measurement by scale. In the event of discrepancies between drawings, between drawings and specification or between specifications, the intent shall be interpreted by the architect, which shall be binding on the contractor. Where a dimension may be missing, the work shall be accomplished in accordance with the directions and dimensions provided by the architect. Dimensions on drawings, as well as detail drawings themselves, are subject in every case to measurements of existing, adjacent, incorporated and completed work which shall be taken by the contractor before undertaking any work dependent upon such data. Dimensions pertaining to the work shall be verified at site by contractor.

**1.2.6** Add subparagraph: Where specifications are of the abbreviated or "streamlined" type, they shall be construed as complete sentences, as shall notes on the drawings. Omission of words such as "the", "the contractor shall", and "as shown on the drawings" is intentional. The words "shall" or "shall be" are to be supplied by inference. Imperative or directive instruction, directions or specifications apply and refer to the contractor. The words "symmetrical" and "similar" are used in the general sense and need not mean "identical".

**1.2.7** Add subparagraph: Where a number is specified (as for gauges, weights, temperatures, an amount of time, and similar reference) and the specified number cannot be obtained, the number shall be interpreted as the next better, as available.

## **ARTICLE 2 - OWNER**

### **2.4 Owner's Right to Carry Out the Work.**

Delete subparagraph and insert instead: If the contractor defaults or neglects to carry out the work in accordance with the contract documents and fails within a seven day period after receipt of written notice from the Owner to the Contractor (and Surety, if applicable) to commence and continue correction of such default or neglect with diligence and promptness. The Owner may after such seven day period give the Contractor (and Surety, if applicable) a second notice to correct such deficiencies within a second seven day period and may require the Surety, if any, to assume the obligations of the Contractor within seven days following receipt by the Contractor (and Surety, if applicable) of this second seven day period. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor (or Surety, if applicable) shall pay the difference to the Owner.

## **ARTICLE 3 - CONTRACTOR**

### **3.2 Review of Contract Documents and Field Conditions by Contractor**

**3.2.1** Add at the end: ; however, Contractor does not represent having examined conditions that are not exposed without demolition unless the necessary demolition is specified or authorized. The Contractor also represents that all Contract Documents for the project have been examined, including those intended for work of trades not normally performed by the Contractor's own forces, and has become thoroughly familiar with all conditions which may pertain to or affect the work under this contract.

### **3.4 Labor and Materials**

**3.4.3** Add to Subparagraph: All work shall be performed in the best and most workmanlike manner to the highest standards for the work. Incompetent or careless workmanship shall not be permitted by the Contractor and will not be accepted.

**3.4.4** Add Subparagraph: The Contractor, and all those working under its jurisdiction, shall conform to labor laws of the state and all other laws, ordinances and legal requirements affecting the work. Prior to starting work, the Contractor shall become familiar with local labor and trade conditions, skilled and unskilled, and shall conform to local conditions. The Contractor shall consider the availability of labor in the area and import labor as may be required to meet the schedule for the work.

**3.4.5** Add Subparagraph: Unless otherwise provided in Contractor Documents, all materials, equipment and other products shall be one of the brands, manufacturers or types specified. All like products for the work shall be by the same manufacturer.

**3.4.6** Add Subparagraph: After the Contract has been executed, the Owner and Architect, after consultation with the Construction Manager, will consider a formal request for the substitution of products in place of those specified only under the conditions set for in the General Requirements (Division 1 of the Specifications).

**3.4.7** Add Subparagraph: By making requests for substitutions based on the preceding subparagraph, the Contractor:

- .1** Represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;
- .2** Represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified;
- .3** Certifies that the cost data presented is complete and includes all related costs under this contract except the architect's redesign costs, and waives all claims for additional costs related to the substitution which subsequently become apparent; and
- .4** Will coordinate the installation of the accepted substitute, making such changes as may be required for the work to be complete in all respects.

### **3.7 Permits, Fees, and Notices**

**3.7.1** Add to Subparagraph: The contractor shall provide and pay for all bonds that may be required to accomplish the work, including any bonds required by municipalities.

**3.7.2** Add to Subparagraph: In any instance where requirements of the Contract Documents are in excess of, but not in conflict with or violation of requirements of a public authority, the provisions of the Contract Documents shall govern.

### **3.8 Allowances**

**3.8.2.3** At the end of the clause add: except where installation is specified as part of the allowance in the general requirements (Division 1 of Specifications).

**3.8.2.4** Add clause: The supplier or subcontractor for an allowance item is subject to acceptance of the Owner, Architect and Construction Manager; and the Contractor's Purchase Order or Subcontract Agreement shall bind the supplier or Subcontractor to the requirements of the Contract Documents.

### **3.11 Documents and Samples at the Site.**

**3.11.1** In the third line before the words "shop drawings" change the word "approved" to "accepted". Before the last full sentence of the paragraph, insert the following: "The record documents shall be a separate set of documents used only for record purposes and kept clean and undamaged."

### **3.12 Shop Drawings, Product Data and Samples**

**3.12.7** In the last line, change the word "approved" to "approved and accepted".

**3.12.8** In the third and last lines, change the word "approval" to "approval and acceptance".

### **3.13 Use of Site**

**3.13.3** Add subparagraph: The contractor shall return all improvements on or about the site, streets and adjacent property which are not shown to be altered, removed or otherwise changes, to the conditions which existed previously. The Contractor shall protect existing structured or other features from damage by any operations in connection with this Contract.

**3.13.4** Add subparagraph: Utilities or other services which are shown, or not shown but encountered or otherwise found, shall be protected by the contractor from any damage from excavation or other work and operations of this contract, unless or until they are abandoned. The contractor shall immediately restore any damage from its work or operations to place the utilities or services which are shown to be abandoned or moved. They shall remain in service, and be protected by the Contractor until new utilities and services have been provided, tested and ready for use.

### **3.14 Cutting and Patching**

**3.14.1** Add to Subparagraph: Cutting and patching shall be kept to an absolute minimum by careful planning and through providing proper holes, sleeves, anchors, inserts or other built-ins as work progresses and then only to the extent required to properly place, support, hang, anchor or install work and finishes to like-new condition, to match adjoining work and shall be performed by workers skilled in the particular type of work involved. Where finishes are patched, they shall be patched to the extent necessary to provide unbroken and unattached appearance and shall be carried to natural break points as necessary. All patching is subject to the Architect's acceptance. Unauthorized or careless cutting will not be permitted. No structural member shall be cut in a manner or to an extent, which will affect the structural effectiveness, unless approved by the Architect.

**3.14.3** Add subparagraph: Cutting and patching of construction work or excavation and backfilling in or around building, shall be done under the general supervision of the contractor for the phase of work being altered, who shall be responsible to see that patching and backfilling is accomplished by using proper labor, materials and methods consistent with the requirements for other similar construction.

### **3.19 Equal Opportunity in Employment (Add this paragraph)**

**3.19.1** Trade contractor shall not discriminate against any employee or applicant for employment because of sex, creed, color, religion, national origin, marital status, status with respect to public assistance, disability, age, or sexual preference. Trade contractor shall take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to the following: employment, upgrading, demotion or transfer, recruitment, recruitment advertising, layoff or termination, rates of pay or other form of compensation and selection for training, including apprenticeship. Trade contractor shall incorporate these same equal opportunity, anti-discrimination and affirmative action requirements into all agreement between trade contractor and its trade subcontractors.

**3.20 Verification of Field Conditions** (Add this paragraph and the following subparagraphs)

**3.20.1** The trade contractor shall take field measurements and verify field conditions with the contract documents and final shop drawings before commencing any work. Report errors, inconsistencies or omissions to the architect and construction manager at once.

**3.20.2** No change in the contract sum will be allowed on account of minor differences between actual field conditions and the contract documents.

**3.21 Miscellaneous Trade Contractor Responsibilities** (Add this paragraph and the following subparagraphs)

**3.21.1** The trade contractor agrees to adequately and properly protect their work. The trade contractor agrees to adhere to the Federal Occupational Safety and Health Act, state and local safety regulations, so as to avoid injury or damage to persons or property resulting from failure to do so.

**3.21.2** In the event the trade contractor, after 24 hour written notice from the construction manager fails to take corrective action to ensure compliance with said safety regulations. The construction manager shall remedy the situation according to OSHA standards and charge the cost of same to the trade contractor's account without further notice to the trade contractor.

**3.21.3** The trade contractor agrees to notify the construction manager's representative on the job site of all accidents, which may occur to persons or property and shall provide the construction manager's representative with a copy of all accident reports on appropriate forms. All reports shall be signed by the trade contractor or his authorized representative and submitted within twenty-four (24) hours of occurrence.

**3.21.4** The trade contractor agrees that all disputes concerning the jurisdiction of trades shall be adjusted in accordance with any plan for the settlement of jurisdictional disputes, which may be in effect either nationally or in the locality in which the work is being done. The trade contractor shall be bound by, and shall abide by, all such adjustments and settlements of jurisdictional disputes, whether or not the trade contractor is signature bound by the agreement establishing the Impartial Jurisdictional Disputes Board and/or its successors. The trade contractor agrees not to cause a work stoppage due to the jurisdictional assignment of work.

**3.21.5** The trade contractor shall submit to the construction manager upon request, copies of orders placed for the various materials required for the project or stock lists if such material is normally a stock item. Order copies need not reflect prices but should indicate type of material, quantity, vendor name, and address, etc. The trade contractor shall be required to submit to the construction manager a monthly material status report, or more often if required by the construction manager, as a prerequisite for the monthly progress payment. The trade contractor shall notify the construction manager immediately upon learning of a change of status of any material, equipment or supplies.

**3.21.6** The trade contractor agrees to maintain an adequate force of experienced workers and the necessary materials, supplies and equipment to meet the requirements of the construction manager and other trades in order to maintain construction progress schedules, as established by the construction manager and owner. In the event that their forces are, in the judgment of the construction manager, inadequate to meet the established schedules during the regular working hours, the trade contractors agree to

work sufficient overtime hours or increase their work force to meet such schedules at no extra cost to the construction manager, architect or the owner.

**3.21.7** The trade contractor agrees to employ competent administrative, supervisory, and field personnel to accomplish the work, including layout, engineering, preparation and checking of shop drawings. Such supervisory personnel shall not be changed without written consent of the construction manager.

**3.21.8** The trade contractor shall insure that all construction tools, equipment, temporary facilities and other items used in accomplished the work, whether purchased, rented otherwise provided by the trade contractor or provided by the others, are in a safe, sound and good condition; capable of performing the function for which they are intended and maintained in conformance with applicable laws and regulations.

**3.21.9** In no event shall any act or omission on the part of the owner, the architect or the construction manager relieve the trade contractor from their obligation to perform their work in full compliance with the contract.

**3.21.10** The trade contractor shall be responsible to the construction manager for the acts and omissions of all their employees and all trade subcontractors, their agent and employees, and all other persons performing any of the work under a contract with the trade contractor.

## **ARTICLE 4 - ARCHITECT AND CONSTRUCTION MANAGER**

### **4.1 General**

**4.1.1** Delete subparagraph, insert instead: The Architect is Zerr Berg Architects, Inc. 510 4th Avenue North, Fargo, ND referred to in the contract documents as singular in number. The term architect means the architect or his authorized representative, including employees or consultants. Where "architect" may be used relating to engineering phases of the work, substitute the term "engineer" therefore.

**4.1.2** Delete subparagraph, insert instead: The Construction Manager is Gehrtz Construction Services, Inc. 510 4th Avenue North, Fargo, ND, referred to in the construction documents as singular in number. The term "construction manager" means the construction manager or the construction manager's authorized representative, including employees or consultants.

### **4.2 Administration of the Contract**

**4.2.2** In the first line between the words "intervals" and "appropriate", insert the words "he deems".

**4.2.11** In the last sentence change the word "approval" to "approval and acceptance".

## **ARTICLE 5 - SUBCONTRACTORS**

### **5.1 Definitions**

**5.1.1** Change the wording of this subparagraph to read as follows: A subcontractor is a person, firm or entity having a direct contract or purchase order with the contractor to provide or furnish materials, equipment, facilities, labor or services, or a combination of these, for the execution and completion of the work or part thereof. The term subcontractor is referred to throughout the contract documents as if singular in number and means a subcontractor or an authorized representative. The term subcontractor does not include other multiple prime contractors, or subcontractors of other multiple prime contractors.

**5.1.2** Change the wording of this subparagraph to read as follows: a sub-subcontractor is a person, or entity having a direct or indirect contract or purchase order with a subcontractor to provide or furnish materials, equipment, facilities, labor or service, or a combination of these, for the execution or completion of the work or part thereof. The term sub-subcontractor is referred to throughout the contract documents as if singular in number and means a sub-subcontractor or an authorized representative thereof.

### **5.2 Award of subcontracts and other contracts for portion of the work.**

**5.2.1** At the end of the first sentence, add: -- along with a list of actual materials or equipment they will be furnishing.

**5.2.3** Add to subparagraph: no increase in the contract sum shall be allowed should a substitution be required as a result of the owner's or architect's reasonable objection based on specified criteria on which a proposed subcontractor will be evaluated.

## **ARTICLE 6 - CONSTRUCTION BY OWNER OR BY OTHER CONTRACTORS**

### **6.2 Mutual Responsibility**

**6.2.1** Change subparagraph to read: The contractor and subcontractors shall cooperate with and coordinate their work with all other contractors and the owner to facilitate the general progress of the project and to prevent delaying the progress of other contractors. The contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work, and shall connect and coordinate contractor's work with theirs as required by the contract documents. Each contractor and subcontractor shall obtain layout drawings, rough-in detail sheets and other pertinent information directly from each other (not from architect nor construction manager) to coordinate all phases of the work. For coordination with the owner's equipment or materials, information shall be obtained from the owner through the construction manager. After timely notification by the contractor of the need to accomplish a particular phase or element of the work, the other contractors shall, within a reasonable time, perform their work so as not to delay or impede the contractor.

**6.2.2** Between the words "construction" and "shall", insert: --, or lack of coordination with other contractors, --

**6.2.3** In the first line, delete the word "wrongfully".

## **ARTICLE 7 - CHANGES IN THE WORK**

### **7.1 Changes**

**7.1.4** Add subparagraph: For proposed changes in the work on the lump sum or time and material methods under Clauses 7.3.1 and 7.3.3.4 above, the costs shall be determined as provided under this subparagraph 7.1.5. The contractor shall submit an itemized list of quantities with the applicable unit costs and extended price for each, in such form and detail as required by the construction manager / architect.

.1 As a minimum the detailed breakdown shall include and indicate the items enumerated below. Items (a) and (b) constitute the cost of labor, and items (c), (d), (e) and (f) constitute the basic costs referred to under this Article 7.

(a) Labor costs, itemized by each trade involved, showing the hourly rates for each, and the hours required for the change. Labor rates shall be the same for extra and credit computations and shall be the actual rate paid workmen in accordance with established management labor agreement.

(b) Burden on labor, which shall be only the actual costs of mandatory fringe benefits required by established agreements, taxes on labor, worker's or workmen's compensation, insurance on labor as affected by payroll, unemployment taxes and insurance, including FICA and FUTA.

(c) Quantities of materials, equipment and supplies, at their actual cost, with unit costs indicated.

(d) The cost of subcontracted work, computed in the same way as provided for under this subparagraph 7.1.5.

(e) Overhead, profit or commission. As noted in Section 01 2000.

(f) Applicable sales tax on materials, added after the above computations are complete.

### **7.4 Minor Changes in the Work**

Add to paragraph: The Architect shall also have the right to make minor changes in dimensions, locations, arrangements, or details to accommodate changes in other materials and equipment, improve the work, or prevent unforeseen interference with structural or other features. Such changes shall be made without a change in the contract sum.

## **ARTICLE 8 - TIME**

### **8.2 Progress and Completion**

**8.2.3** In the second line change the word "substantial" to "final". Add to subparagraph: The work shall not be suspended or shut down, but shall progress continuously with sufficient labor at all times, unless otherwise approved by the owner, architect and construction manager.

### **8.3 Delays and Extensions of Time**

**8.3.3** Change subparagraph to read: This paragraph 8.3 does not exclude the Owner's recovery of damages for delay under other provisions of the contract documents. The contractor's sole and exclusive remedy for delay is a right to a time extension for completion of the contract and not damages.

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

### **9.2 Schedule of Values**

In the first line, after the words, "Before the first Application for Payment," insert "in accordance with other requirements of the contract documents,"

### **9.3 Applications for Payment**

**9.3.4** Add Subparagraph: The contractor shall submit his Application for Payment on forms as the Construction Manager / Architect may specify or direct. The Application shall be accompanied by a sworn, notarized Certificate by the Contractor, attesting to the accuracy of the amount as being for work satisfactorily complete in accordance with the Contract Documents, and that all just claims and bills for labor, materials, equipment, subcontracts and services or other expenses represented in previous Applications for Payment have been paid, such that the Contractor is entitled to the payment.

**9.3.5** Add Subparagraph: Except where the statutory requirements apply, progress payments shall be made monthly upon application, in the amount of 90% of the Work completed and materials described under 9.3.2. For a Contract over \$100 thousand, the Architect will authorize the payment of 100% of the amount completed after a total of 5% of the Contract amount has been retained, providing progress on the Work is in accordance with or ahead of the Contractor's Progress Schedule and is otherwise satisfactory to the Architect, and if the Contractor has filed a Consent of Surety with the Architect.

### **9.5 Decisions to Withhold Certification**

**9.5.1** In the fourth line change the words "certify payment" to "issue a Certificate for Payment".

### **9.6 Progress Payments**

**9.6.6** Change subparagraph to read: Issuance of a Contractor's Application and Certificate for Payment, a Progress Payment, or partial or entire use of occupancy of the project by the Owner shall not constitute an acceptance of any work not in accordance with the Contract Documents. The Contractor (and its Surety, if applicable) agree any issuance of a Contractor's Application and Certificate for Payment by the Architect, payment on the Contract Sum or in reducing any retaining amount, or any use of occupancy of the work will in no way relieve them of the obligation to completely fulfill or accomplish all obligations of the contract, including warranty of the work, and that they waive an actual or alleged rights of subrogation or action against the owner or the architect as a result of any such issuance of a Contractor's Application and Certificate for Payment, payment or use or occupancy. At any time the Surety (if any) shall have the right to examine the status of the work, as well as any payments, and may request the Owner to withhold additional sums as it considers appropriate to protect its interests.

### **9.8 Substantial Completion**

**9.8.6** Add Subparagraph: After Substantial Completion the Contractor shall coordinate his activities with the Owner's use of substantially completed work and shall diligently

complete the remaining work, without delay or interruption, within the remaining contract time.

#### **9.10 Final Completion and Final Payment**

**9.10.2** In the second line between the word "Construction Manager" and the number "(1)" insert the following: "Such substantiation of the Contractor's Right to Payment as the Owner may require such as and including --."

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

#### **10.2 Safety of Persons and Property**

**10.2.4** Add to subparagraph: and shall give the Owner reasonable advance notice.

**10.2.5** In the seventh line between the words "fault" and "or", insert the words "acts, operations, methods."

#### **10.5 Add paragraph: Miscellaneous General Provisions**

**10.5.1** The requirements under 10.4, Miscellaneous General Provisions, shall be considered as minimum requirements and shall not be construed to limit the amount of protection required to safeguard all persons and property, nor construed as directing or establishing the Contractor's methods or responsibilities.

**10.5.2** The Contractor shall provide and maintain adequate fire extinguishers in and around the construction area, available to all workers, but shall not use extinguishers that are to be installed in the work.

**10.5.3** The Contractor shall provide and maintain guard lights at barricades, railings, obstructions in streets, roads or sidewalks and at trenches or pits including at those adjacent to existing buildings, public roads, walks and similar locations where a hazard may exist. The Contractor shall provide and maintain suitable barricades or fences around excavations, including trench excavations, excavated by contractor or subcontractors.

**10.5.4** As may be applicable to the project, the contractor shall provide and be responsible for: protection of equipment, materials, and supplies from water and other damaging elements; providing proper adequate drainage (temporary and permanent) of the site in connection with work of this contract; damage to property as a result of work or operations under this contract, including but not restricted to damage from water, excavation, underpinning, removal or changing of structural supports; collapse or other failure to the project resulting from the contractor's acts, operations or work, including water undermining or creating pressure on the construction; pumping of water from work areas and excavations of this contract, and spaces built, constructed or opened up under the contract, and spaces built, constructed or opened up under the contract, and if necessary, installing temporary heat to keep the spaces dry; providing protection and planking on finished floors and other finished surfaces where work is being done by the contractor or subcontractor; closing and protecting all holes or openings through walls, floors and roofs that are cut or built by the contractor or subcontractors; and which will admit water to interior spaces during the construction period or will create a potential safety hazard; removal of snow to accomplish the work; keeping premises in neat and orderly condition; eliminating fire hazards.

**10.5.5** As may be applicable to the project and to his work, the contractor shall be responsible for the following; providing safe and adequate stairways (temporary and permanent) for the use of all trades; maintaining access to the site; proper protection by heating of an enclosed building during cold weather; protection for trees and other similar features, which are to remain, from damage from operations in connection with project, by boxing tree trunks and setting up barricades at sufficient distance to prevent damage to branches; the removal of accumulated snow and ice within a building, which generally shall be hauled out (not melted), unless it is a minor amount, as approved by architect / construction manager.

**10.5.6** The contractor and each subcontractor shall provide storage and enclosures to protect and preserve the materials stored at and off the site. Materials such as wood,

metal, cement, masonry materials, equipment of any type, conduit and similar materials shall not be set directly on the ground. Coverings shall be durable, watertight, fully cover sides as well as top, substantial and well anchored to prevent blowing away. Shed type enclosures shall be provided for easily damaged and small items. Any protection which becomes damaged shall be replaced immediately. Contractor's storage shall be reviewed and accepted by the construction manager, as it relates to site coordination.

## **ARTICLE 11 - INSURANCE AND BONDS**

### **11.1 Contractor's Liability Insurance**

**11.1.1** Delete subparagraph and insert instead: Contractor and Subcontractor shall purchase and maintain commercial general liability insurance as required to protect the construction, subcontractor, construction manager, architect and owner from claims set forth below which may arise out of, or result from, operations of the contract under this contract, whether such claims arise during contractor / subcontractor performance or subsequent to completion of operations under the contract / subcontract and whether such operations by contractor, subcontractor or by anyone for whose acts contractor or subcontractor may be liable. Insurance shall be purchased from a company licensed to do business in the state where the project is located, and shall be written for not less than the limits of liability specified below or required by law, whichever is greater. The types of claims, required coverage and minimum limits of liability are as follows:

**A.** Claims under the contractor or subcontractor Worker's Compensation, disability benefit and other similar employee benefits acts; claims for damages because of bodily injury, occupational sickness or disease or death of employees. Insurance coverage shall include: Statutory Workers' Compensation, including Employer's Liability with a minimum limit of \$100,000 for each employee.

**B.** Claims for damages because of bodily injury, occupational sickness or disease, or death, by any person other than employees; claims for personal injuries which are sustained (1) by any person as a result of an act or omission directly or indirectly related to the employment of such person by the contractor or subcontractor or (2) any other person; claims for damages other than to the work itself, because of injury to or destruction of tangible property including loss of use resulting there from.

Insurance coverage shall include:

Premises - Operations

Products - completed Operations

Blanket Contractual - as will cover the provisions of the contract or subcontract, including but not limited to any indemnity provision.

Broad form property damage.

Personal injury

Blanket explosion, collapse and underground property damage

Operations of independent contractors

Policy Limits:

- General Aggregate	\$2,000,000
- Product / Completed Operations Aggregate	\$1,000,000
- Person Injury	\$1,000,000
- Each Occurrence	\$1,000,000

**C.** Claims for damages because of bodily injury or death of any person, or any property damage, arising out of the ownership or use of any motor vehicle. Comprehensive automobile liability insurance including owned, hired and non-owned vehicles with limits of \$1,000,000.

**D.** The coverage limits required by Paragraphs (B) and (C) above may be achieved by the use of an Umbrella Excess Liability Policy.

**E.** The limits of liability specified shall be considered minimum requirements.

**F.** Acceptance of the insurance by the construction manager shall not relieve or decrease the liability of the contractor or subcontractor. The construction manager, architect and owner do not in any way represent that the insurance or limits of

insurance specified above are sufficient or adequate to protect the contractor's or subcontractor's interest or liabilities, but are minimums.

**11.1.3** Change the number "30" in line seven to "60".

### **11.3 Property Insurance**

**11.3.1.3** Change to read as follows: The contractor submitting the claim will be responsible for the deductible portion of the claim. The Owner will have a \$10,000.00 deductible. The Owner's policy does not include coverage for contractor's equipment or materials stored off-site. It is the contractor's responsibility to properly secure all on-site materials. Unsecured on-site storage is not eligible for a claim.

**11.3.1.4** Omit paragraph.

**11.5.1** Add subparagraph: ALL insurance shall contain a provision that coverage afforded under any of the aforesaid insurance policies shall not be canceled or materially changed without at least sixty (60) calendar days prior written notice to construction manger, and the owner on all "accord" form certificates of insurance, the words "endeavor to" and the remaining words beginning with "but failure to" will be stricken from the cancellation notice provision.

**11.6.1** Add subparagraph: All aforesaid insurance policies shall be underwritten with responsible insurance carriers with Best's Ratings of not less than A 10 and otherwise satisfactory to construction manager and the owner and licensed to provide insurance in the state in which the project is located. Non-admitted carrier may be considered on an individual basis.

**11.7.1** Add subparagraph: The contractor / subcontractor is responsible at contractor's / subcontractor's expense and not a reimbursable expense for providing any additional insurance contractor / subcontractor deems necessary to protect contractor's / subcontractor's interest from other hazards or claims in excess of the aforementioned minimum insurance coverage.

## **ARTICLE 12 - UNCOVERING AND CORRECTION OF WORK**

### **12.1 Uncovering of Work**

**12.1.1** Add to subparagraph: The contractor shall give timely notice to the architect, through the construction manger, of the readiness of the work to be observed.

**12.1.2** In the second line between the words "the" and "construction manager", insert the words "contract documents or the -".

### **12.2 Correction of Work**

**12.2.1** Add at end of first sentence: "Unless the Owner elects to accept the work as provided for under paragraph 12.3". Add at the end of the subparagraph: "Work rejected before final completion shall be corrected prior to the processing of the final contractor's Application and Certificate for Payment.

**12.2.2** Add the following at the end of the subparagraph: The expiration of the above one year or any other specified time period, or any other period prescribed by law, shall not relieve the contractor of the obligation for the expense to correct any defect in the work or deficiencies which are not readily ascertained, including but not limited to defective materials and workmanship, defects attributable to material substitutions for specified material, substandard performance or otherwise not in compliance with the contract documents. Such latent defects of deficiencies shall be corrected as provided in this paragraph 12.2. Following the correction or replacement of any of the work, as above specified, the contractor shall correct any defects or deficiencies in corrected or replaced materials and workmanship, which is found within one year after the date of correction or replacement.

**12.2.6** Add subparagraph: For the purpose of the commencement of the specified periods covered by this Article, or any other special specified period, the date of the inspection for substantial of the last unit, part or phase of the work shall be the starting date of the period, for all of the work, except for any work noted as incomplete or unsatisfactory at that time. The period covered by this article for said incomplete or unsatisfactory work

shall start on the date of specifically noted dates of inspection for substantial complete, (or of acceptance, in writing, by the owner of corrected work), the date of the architect's issuance of the final Certificate and Application for Payment on the entire contract will be the start of the period.

## **ARTICLE 13 - MISCELLANEOUS PROVISIONS**

### **13.5 Tests and Inspections**

13.5.1 Delete last sentence of subparagraph.

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

### **14.2 Termination by the Owner for Cause**

**14.2.2** Change wording to read: When any of the above reasons exist, the Owner, with the advice of the architect and construction manager, may, without prejudice to any other rights or remedies of the owner and after giving the contractor and contractor's surety seven days' written notice, require the surety to promptly take over and complete the work under the terms of the contract. Should the surety fail to assume the obligations of completing the work within ten days after receipt of the written notice the owner may, upon seven days' additional notice, terminate the employment of the contractor (except the obligations under the bond) and may:

.1 Take possession of the site and of all materials, equipment, tools, construction equipment and machinery thereon owned by the contractor and may finish the work by whatever method the owner may deem expedient.

.2 Accept assignment of subcontracts pursuant to paragraph 5.4

**14.2.3** In the second line between the words "Contractor" and "shall" insert the words "or Contractor's Surety".

**14.2.4** Change the wording to read: If the Owner complete the work and the unpaid balance of the contract sum exceeds the costs of finishing the work, including the owner's additional costs, attorneys' costs and compensation for the construction manager's and architect's additional services, such excess shall be paid by the contractor. If such costs for the owner to complete the work exceed such unpaid balance, the contractor and/or his surety shall pay the difference to the owner. The amount to be paid to the contractor or to the owner, as the case may be, shall be certified by the owner or contractor and reviewed by the construction manager, and approved by the architect and this obligation for payment shall survive the termination of the contract.

## **ARTICLE 16 - ADDITIONAL CONDITIONS (ADD THIS ARTICLE AND THE FOLLOWING PARAGRAPHS)**

### **16.1 Additional Definitions**

**16.1.1** Provide: As used in connection with labor, materials and equipment shall mean to furnish and install complete, including connections to utilities or service, complete anchorage and suspension, fastening or anchor devices, trim, finish and other related work, unless specified otherwise.

**16.1.2** Accepted, approved, satisfactory, equal to, proper, as directed and similar terms: These shall mean the decision rests with the architect, whose decision shall be final and binding upon the contractor and subcontractors.

**16.1.3** Project, work, job: In the technical sections or on the drawings, these terms may be used interchangeably and are synonymous. They shall mean the facility, construction and/or improvement within the intent and scope of the contract documents. The terms shall mean the entire facility, or separable parts as appropriate to the use of the term, including that under subcontract where applicable, and includes labor, materials, equipment, service and skill.

**16.1.4** Notice to Proceed: This shall be written notice by the construction manager to the contractor to commence work of the contract, issued either before or after execution of the contract. In issuing the notice, stipulations may be included as to time and other requirements that may condition commencement of the work.

## **16.2 Use of Drawings and Specifications**

**16.2.1** During construction, the contractor shall examine and use all specifications and drawings for the project, including those that may primarily pertain to other work the contractor normally does not perform with his own forces. The contractor shall use all of the project drawings and specifications: for a complete understanding of the project and the work; to determine the type of construction and systems; for coordination; to determine what other work may be involved in various parts or phases; to anticipate and notify others when work will be required; and all other relevant matters related to the project. The contractor shall also be bound by all the requirements to complete his work, that are applicable to, pertain to, or affect the work, as may be shown or inferred by the entire set of drawings and specifications.

## **16.3 Periodic Payment Estimate**

**16.3.1** When required by the owner to establish a schedule of money available to make payment of periodic Applications for Payment, the contractor shall provide an estimate by months; of the anticipated amounts for each periodic payment. The retained percentage shall be considered in the estimate schedule, as well as anticipated job progress and materials delivery. The schedule will be deemed an estimate only, for financial planning purposes, and the contractor shall not be bound to conform to the schedule. The schedule may be required by the contract documents or requested by the owner and contract execution.

## **16.4 Layout of the Work**

**16.4.1** The Construction Manager, on behalf of the Owner, shall provide surveyor and control points to be utilized for each contractor to layout their work.

**16.4.2** The contractor shall recognize that the drawings necessarily are diagrammatic, in many instances. All work and in particular, exposed piping, ducts, conduit and similar items shall be neatly and carefully laid out to provide the most useful space utilization and the most orderly appearance. Except as otherwise indicated or directed, piping and similar work shall be installed as close to ceilings and walls as conditions permit, located to prevent interference with other work or with the use of the spaces in the manner required by the functions of the room and the owner. Valves shall be located in inconspicuous but accessible places. Before proceeding with any work, particularly where exposed, the contractor shall carefully plan the layout and review it with the architect and construction manager for acceptability of location.

**16.4.3** The contractor shall verify grades, lines levels and dimensions shown on drawings and report any errors or inconsistencies to architect, through the construction manager for decision before commencing work. The contractor and subcontractor shall be responsible for the correct location, dimensions and elevations of his work. As the work progresses, the contractor shall be responsible for the layout of the exact location of all partitions and similar features, as guide to all trades.

## **16.5 General Quality of Work, Installation and Operation**

**16.5.1** All the work shall be strictly first quality, in materials, erection, installation and workmanship.

**16.5.2** The contractor shall request interpretations from the architect, through the construction manager, for the following: work indicated on the drawings or specified in such a manner as to make it impossible to produce work of the highest quality within the space shown; possibilities of damaging effects of expansion and contraction; discrepancies found between drawings or between drawings and specifications. If the contractor does not request such interpretation, no excuse will be entertained thereafter for failure to carry out and guarantee the work in a satisfactory manner. Elements of the work intended to protect against the weather shall be guaranteed weatherproof and watertight.

**16.5.3** Proper performance of the contract shall imply correct and proper placement, proper or published results for products and equipment, fitting and operation of fixed or movable and operating parts of the work, including doors, windows, hardware and all

systems and equipment. Materials and equipment shall be completed in every respect, with parts, connections, anchors, devices, backing, fittings and other necessary items, and shall be completely installed, anchored, fitted and placed in operating condition. Before buying, construction or installing work, the contractor shall notify the architect of conditions, which exist in the contract documents, which will adversely affect proper operation of first quality installation.

**16.5.4** Throughout the project, accommodate various materials and pieces of equipment that are fitted to their materials and equipment and various materials that are applied to which other materials attach. Take all reasonable precautions to insure materials, devices, items, equipment or other products can be satisfactorily applied or installed to each other or work of others and make necessary adjustments during preparation of shop drawings or in advance of field work, or stop work to accommodate other work.

**16.5.5** Materials or equipment shall be installed or applied according to directions of the manufacturer or recommendations of an association dealing primarily with materials, unless specifically designated otherwise. In no case shall installation, including any temporary work necessary (i.e. shoring), be below standards recommended by manufacturer. Where specified requirements exceed the manufacturer's standards, the specifications shall govern. Fabrication (including reinforcing and accessories) and installation shall be provided to insure proper placement and use of the item or material under the location, use, condition and available space to serve intended function and to meet code requirements. Equipment devices shall be provided and installed to "fail safe" under normal operating conditions and it shall be contractor's obligation to provide and install work in such manner.

## **16.6 General Fire Safety**

**16.6.1** The contractor shall exercise extreme care to maintain and exercise adequate fire safety precautions throughout construction. This shall include providing sufficient devices, watchmen, standby helpers or other precautions during construction, in use of temporary heat, welding, brazing, sweating, testing or other phases of work. Welding, brazing, cutting and sweating operations performed in vicinity of, or accessible to, combustible material shall be adequately protected to make certain that sparks or hot slag do not reach the combustible material and start a fire. Glass and glazed material shall be masked from splatter. When necessary to do cutting, welding, brazing, sweating, in vicinity of wood, or combustible materials (and the combustible material cannot be removed), the material shall be adequately protected with fireproof coverings. In addition, a helper shall be stationed nearby with proper fire extinguishers to guard against sparks and fire.

**16.6.2** Whenever combustible materials have been exposed to sparks, molten metal, hot slag, or splatter, a man shall be kept at the place of work for at least two hours after completion to make sure that smoldering fires have not been started. Whenever cutting or welding operations are carried on in a vertical pipe shaft, a man to act as a fireguard shall be employed to examine floors below the point of cutting or welding. This fireguard shall be kept on duty at least two hours after completion of the work to guard against fires and he shall examine each level after this time, prior to leaving.

**END OF SECTION**



**SECTION 01 1400  
WORK RESTRICTIONS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. This section of the Project Manual establishes Owner requirements and construction-related work restrictions. The provisions of this section shall be considered part of the Contract Documents. Each Contractor shall ensure full compliance by all personnel with the requirements herein.

**1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Section 01 5000 - Temporary Facilities and Controls
- C. Section 01 7000 - Execution and Closeout Requirements.

**1.03 RADIOS**

- A. Radios are only to be used upon direct approval of the Construction Manager.

**1.04 FIREARM, DRUG, ALCOHOL, AND TOBACCO-FREE SITE**

- A. The entire site shall be free of firearms, drugs, controlled substances, alcohol, tobacco, cigarettes, chew, vaping, etc., and shall remain so during the entire construction period. The entire project site is defined as everything located within the site property lines, including the construction trailer(s) and any vehicles located on the project site.

**1.05 USE OF PREMISES**

- A. Use of Site: Limit use of the premises to work in areas indicated. Do not disturb portions of the site beyond areas in which the Work is indicated.
  - 1. Limits: Confine construction operations to the space indicated on the Phasing Plan.
  - 2. Owner Occupancy: Allow for Owner occupancy of site during construction.
  - 3. Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
    - a. Schedule deliveries to minimize use of driveways and entrances. Verify the location of approved delivery drops with the Owner.
  - 4. Existing Trees and Plants:
    - a. Provide adequate protection to prevent damage by the Contractor or subcontractors.
    - b. Trim obstructing branches only with Architect's approval prior to any operations that could damage trees.
    - c. Damage to trees or plants may require replacement with acceptable size stock at no additional cost to the Owner.
  - 5. Existing Lawns:
    - a. Access to the building via lawns shall be limited. Do not drive across lawns without permission by the Construction Manager.
    - b. Permission to drive across existing lawn areas will only be granted with the presumption that the Contractor will restore the lawn to its original condition.
    - c. Ruts and tire tracks shall be filled and new sod installed as required to restore damaged lawn areas.
- B. Utility Interruptions
  - 1. Contractor shall provide the Owner with a minimum of 48 hours' prior notice before shutting down or interrupting any utility service.
  - 2. Data and communication wiring shall not be cut, disconnected, or otherwise interrupted without first verifying that such lines are inactive. The Contractor shall be responsible for

repairing, at the Contractor's expense, any damage resulting from failure to confirm line status prior to interruption.

#### **1.06 REMOVAL FROM SITE**

- A. The Owner reserves the right to deny or revoke site access to any individual at any time.
- B. The Contractor shall immediately remove any individual from the site upon direction of the Owner.

### **PART 2 PRODUCTS**

#### **2.01 SIGNAGE**

- A. Type - "NO SMOKING": Equal to R5300 No Smoking Sign by Safety Signs, [www.safetysign.com](http://www.safetysign.com); Minimum 7-inches wide by 10-inches high; 3.5 mil adhesive-backed vinyl label; outdoor grade; white background with dual black borders; label design includes international no smoking symbol with black cigarette/smoke and red cross out circle, located on top half of sign; lower half of sign label reads "NO SMOKING" in black text.
- B. Quantity: As required to meet execution requirements below.

### **PART 3 EXECUTION**

#### **3.01 ENFORCEMENT**

- A. Each subcontractor shall be responsible for enforcing the requirements of this section.

#### **3.02 SIGNAGE - "NO SMOKING"**

- A. The Construction Manager shall provide and maintain "No Smoking" signage clearly visible throughout the project site for the duration of construction.

#### **3.03 ADMINISTRATIVE FEE FOR VIOLATIONS OF "NO SMOKING" POLICY**

- A. Should the "No Smoking" policy be violated, the Owner will charge an administrative fee of \$150 per occurrence, to be deducted from final payment to the Responsible SubContractor.
- B. When the "No Smoking" policy has been violated, the Owner will utilize the administrative fee to compensate the Architect for additional services.

**END OF SECTION**

**SECTION 01 2000  
PRICE AND PAYMENT PROCEDURES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Procedures for preparation and submittal of applications for progress payments.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 5200 - Agreement Form: Contract Sum, retainages, payment period, monetary values of unit prices.
- B. Section 00 7200 - General Conditions: Additional requirements for progress payments, final payment, changes in the Work.
- C. Section 01 2010 - Change Order Procedures: Percentage allowances for overhead and profit.
- D. Section 01 2100 - Allowances: Payment procedures relating to allowances.
- E. Section 01 2200 - Unit Prices: Payment and modification procedures relating to unit prices.
- F. Section 01 7800 - Closeout Submittals: Project record documents.

**1.03 SCHEDULE OF VALUES**

- A. Use Schedule of Values Form: AIA G703, edition stipulated in the Agreement.
- B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.
- C. Forms filled out by hand will not be accepted.
- D. Submit Schedule of Values in duplicate within 15 days after date established in Notice to Proceed.
- E. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section. Identify site mobilization and bonds and insurance.
- F. Include in each line item, the amount of Allowances specified in this section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.
- G. Revise schedule to list approved Change Orders, with each Application For Payment.

**1.04 APPLICATIONS FOR PROGRESS PAYMENTS**

- A. Payment Period: Submit at intervals stipulated in the Agreement.
- B. Use Form AIA G702 and Form AIA G703, edition stipulated in the Agreement.
- C. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- D. Forms filled out by hand will not be accepted.
- E. Execute certification by signature of authorized officer.
- F. Each Application of Payment must be notarized by a duly authorized Notary Public.
- G. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
- H. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.
- I. Submit three hard-copies of each Application for Payment.
- J. Include the following with the application:
  - 1. Transmittal letter as specified for submittals in Section 01 3000.
  - 2. Construction progress schedule, revised and current as specified in Section 01 3216.

3. Affidavits attesting to off-site stored products.

K. When Architect requires substantiating information, submit data justifying dollar amounts in question.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

**SECTION 01 2010  
CHANGE ORDER PROCEDURES**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This section shall establish procedures for the submission of change order proposals.
- B. Change Orders may also be known as "Contract Amendments". The two terms may be used interchangeably with the same meaning.
- C. Changes in the work involving an adjustment in the contract price shall be authorized by a written change order signed by the Owner.
- D. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.
- E. This section specifies administrative and procedural requirements for handling and processing contract modifications.

**1.02 CHANGE ORDER PROCEDURES**

- A. Processing Procedure:
  - 1. Upon the determination of the Architect, Construction Manager, and Owner that extra work beyond that indicated on the drawings and/or specifications, or that certain portions of the work will be deleted from the Contract, the Contractor shall submit a change order proposal to the Construction Manager for review.
  - 2. Upon acceptance of the change order proposal, the Construction Manager will prepare copies of the change order and obtain the necessary signatures of the Contractor and Owner indicating acceptance of the amendment of the contract.
  - 3. Copies of the change order will be distributed by the Construction Manager to the Owner and Contractor, Architect and other agencies or individuals as required.
- B. Change Order Proposals
  - 1. The proposal shall be itemized to show the following:
    - a. Quantities and cost of materials F.O.B. jobsite
    - b. Costs of labor
    - c. Subcontractors work and cost thereof
    - d. Overhead\*
    - e. Profit
  - 2. Proposals may be either "Add" or "Deduct" types as necessary to cover the change.
  - 3. Allowable mark ups for overhead and profit.
  - 4. All proposals shall include allowances for overhead and profit as follows:
    - a. When change order proposals include an add and deduct as part of the same change, one overhead and one profit figure shall be used for the difference. Overhead and profit figures shall be based on the following tables.

5. Add type change order proposal mark-up shall not exceed the following:

Construction Contract Amounts	Up to \$100,000	\$100,000 to \$500,000	\$500,000 to \$1 Million	\$1 Million to \$2 Million	Over \$2 Million
Overhead	10%	9%	7%	5%	3%
Profit	6%	5.5%	5%	4.5%	4%

6. Deduct type change order proposal mark-up shall not be less than the following:

Construction Contract Amounts	Up to \$100,000	\$100,000 to \$500,000	\$500,000 to \$1 Million	\$1 Million to \$2 Million	Over \$2 Million
Overhead	10%	9%	7%	5%	3%
Profit	3%	2.75%	2.5%	2.25%	2%

7. \*Overhead includes general office operating costs that are not direct costs related to the project. Overhead items would include but are not limited to general company insurance, office rental or operating costs, company vehicles and/or equipment, etc. Overhead shall also include Performance/Payment Bond costs associated with the contract amendments.

**END OF SECTION**

## **SECTION 01 2100 ALLOWANCES**

### **PART 1 GENERAL**

#### **1.01 SUMMARY**

- A. This Section includes administrative and procedural requirements governing allowances.
  - 1. Selected materials and equipment are specified in the Contract Documents by allowances. In some cases, these allowances include installation. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.
- B. See Section 00 7200 - General Conditions for additional requirements.

#### **1.02 SUBMITTALS**

- A. Comply with 01 3000 - Administrative Requirements.
- B. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.
- C. Submit invoices or delivery slips to show the actual quantities of materials delivered to the site for use in fulfillment of each allowance.

#### **1.03 ALLOWANCE BREAKDOWN**

- A. These allowances shall cover the cost to the Contractor, less any applicable trade discount, of the materials and equipment required by the allowance, delivered at the site, and all applicable taxes.
- B. The Contractor's costs for unloading and handling on the site, labor, installation costs, overhead, profit, and other expenses contemplated for the original allowance shall be included in the Contract Sum and not in the allowance.
- C. Whenever the cost is more or less than the allowance, the Contract Sum shall be adjusted accordingly by Change Order, the amount of which will recognize changes, if any, in handling costs on the site, labor, installation costs, overhead, profit, and other expenses.

#### **1.04 SCHEDULE OF ALLOWANCES**

- A. The General Work and Labor Contractor (Bid Package **6A**) shall include in their proposal an allowance of 40 hours for one carpenter to work at the direction of the Construction Manager during the construction period of the project. General Work and Labor Contractor shall also include a materials allowance of \$1,500. The work to be provided by these individuals will include but not be limited to the following:
  - 1. Unloading and storing materials, equipment, etc. that has not already been specified as part of the General Work and Labor contract.
  - 2. Moving materials, equipment, etc. as may be necessary to accommodate various contractors in completing their work.
  - 3. Cleaning work beyond that specified under Section 01 7000 - Execution and Closeout Requirements.
  - 4. Constructing and/or removing temporary facilities not covered under Section 01 5000 - Temporary Facilities and Controls.
  - 5. Receiving project material and equipment deliveries in the absence of the Construction Manager.
  - 6. A weekly time sheet shall be prepared by the General Work and Labor Contractor and submitted to the Construction Manager for recording. Upon completion of the project, any difference in time will be adjusted by Change Order. Rates of pay for the laborer and carpenter shall be the same as the base pay and fringe benefits received for the work they are doing for the General Work and Labor Contractor on the project.

- B. The Drywall Contractor (Bid Package 9B) shall include in their proposal an allowance of 40 hours for one framer/taper to work at the direction of the Construction Manager. Drywall Contractor shall also include a materials allowance of \$2,000.
  - 1. A weekly time sheet shall be prepared by the Drywall Contractor and submitted to the Construction Manager for recording. Upon completion of the project, any difference in time will be adjusted by Change Order. Rates of pay for the framer and taper shall be the same as the base pay and fringe benefits received for the work they are doing for the Drywall Contractor on the project.
- C. Floor Preparation Allowance: The Resilient Flooring and Carpeting Contractor(s) (Bid Package 9G) shall include in their proposal a material and labor allowance of \$0.10/per SF for floor patching and preparation. Additional material required beyond the allowance or less than the allowance will be charged to the project at \$65 per bag.
- D. The Painting Contractor (Bid Package 9I) shall include in their proposal an allowance of 40 hours for one painter to work at the direction of the Construction Manager.
  - 1. A weekly time sheet shall be prepared by the Painting Contractor and submitted to the Construction Manager for recording. Upon completion of the project, any difference in time will be adjusted by Change Order. Rates of pay for the painter shall be the same as base pay and fringe benefits received for the work they are doing for the Painting Contractor on the project.
- E. The Electrical Contractor (Bid Package 26) shall include in their proposal an allowance of 40 hours for a journeyman type electrician to work at the direction of the Construction Manager. In addition to these hours, the Electrical Contractor shall also include furnishing materials, equipment, and labor to install 20 duplex outlets as determined by the Construction Manager. The Electrical Contractor shall also include a materials allowance of \$2,000.
  - 1. A weekly time sheet shall be prepared by the Electrical Contractor and submitted to the Construction Manager for recording. Upon completion of the project, any difference in time will be adjusted by Change Order. Rates of pay for the journeyman shall be the same as the base pay and fringe benefits received for the work they are doing for the Electrical Contractor on the project.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

**SECTION 01 2300  
ALTERNATES**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. The bidder shall bid on each Alternate specified as part of the specifications. Alternates not specifically requested will not be considered unless prior approval has been granted by the Construction Manager and Architect.
- B. The technical sections of these specifications shall also apply to the Alternate work, whether so noted in each technical section or not.
- C. Drawings and general provisions of the Contract, including General Conditions and Supplementary Conditions and other Division 00 and 01 Specification Sections apply to this Section.
- D. This Section includes administrative and procedural requirements governing Alternates.

**1.02 ACCEPTANCE OF ALTERNATES**

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.
- B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

**1.03 SCHEDULE OF ALTERNATES**

- A. Alternate No. 1: West Restroom.
  - 1. Alternate Bid: All bid package work associated with the installation of a restroom between the classrooms on the west side of the building (including demolition of the existing spaces).
- B. Alternate No. 2: Classroom Finish Upgrades.
  - 1. Alternate Bid: All bid package work associated with providing and installing new finishes in the classrooms indicated on the drawings.
- C. Alternate No. 3: Mother's Room.
  - 1. Alternate Bid: All bid package work associated with the installation of a mother's room (including demolition of the existing spaces).

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

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**SECTION 01 2600  
WORK BY OTHERS**

**PART 1 GENERAL**

**1.01 WORK BY OTHERS**

- A. The Owner will supply the miscellaneous items as outlined below:
  - 1. All appliances, including: refrigerators and microwaves. Note: Connections to be made by mechanical, plumbing, & electrical contractors as necessary.
  - 2. Printers, Copiers, and Ipads are by Owner.
  - 3. Paper Towel Dispensers. Installed by Contractor, under Bid Package 6A.
  - 4. Soap Dispensers. Installed by Contractor, under Bid Package 6A.
  - 5. Toilet Paper Dispensers. Installed by Contractor, under Bid Package 6A.
  - 6. Sanitary Napkin Disposals. Installed by Contractor, under Bid Package 6A.
  - 7. TV Monitors and mounting hardware/brackets. Installed by Owner, wall blocking to be installed by Contractor, under Bid Package 6A.
  - 8. Lettering and signage by Owner. Construction Manager to coordinate with Owner for blocking. Any blocking is to be provided and installed by 6A.
- B. The Owner will arrange for and deliver necessary shop drawing, product data, and samples to the Construction Manager
- C. The Owner will arrange and coordinate delivery of Owner-furnished items with the Construction Manager according to the Construction Schedule.
- D. Following delivery, the Owner will inspect items delivered for damage. If the Owner-furnished items are damaged, defective, or missing, the Owner will arrange for replacement.
- E. The Construction Manager shall designate delivery dates of Owner-furnished items in the Construction Schedule.

**END OF SECTION**

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**SECTION 01 3000  
ADMINISTRATIVE REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. General administrative requirements.
- B. Electronic document submittal service.
- C. Preconstruction meeting.
- D. Progress meetings.
- E. OwnerArchitectConstruction Managerr (OACM) Meetings
- F. Coordination drawings.
- G. Submittals for review, information, and project closeout.
- H. Number of copies of submittals.
- I. Requests for Information (RFI) procedures.
- J. Submittal procedures.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 3216 - Project Construction Schedule: Form, content, and administration of schedules.
- B. Section 01 6000 - Product Requirements: General product requirements.
- C. Section 01 7000 - Execution and Closeout Requirements: Additional coordination requirements.
- D. Section 01 7800 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

**1.03 DEFINITIONS**

- A. Coordination drawings show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or to function as intended.
- B. Field samples are full-size physical examples erected on-site to illustrate finishes, coatings, or finish materials. Field samples are used to establish the standard by which the Work will be judged.
- C. Mockups are full-size assemblies for review of construction, coordination, testing, or operation; they are not samples.

**1.04 GENERAL ADMINISTRATIVE REQUIREMENTS**

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

**1.05 PROJECT COORDINATOR**

- A. Project Coordinator: Construction Manager.
- B. Overall Project Coordination will be the responsibility of the Construction Manager as outlined in Section 00 7200 - General Conditions. As noted therein, in no way is the Construction Manager responsible for, or does he have control or charge of procedures, or for safety precautions and programs in connection with the work, but rather will provide the scheduling and coordination of the work of the various Contractors as a convenience to them as well as a service to the Owner.
- C. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for site access, traffic, and parking facilities.
- D. During construction, coordinate use of site and facilities through the Project Coordinator.

- E. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- F. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Responsibility for providing temporary utilities and construction facilities is identified in Section 01 5000 - Temporary Facilities and Controls.
- G. Coordinate field engineering and layout work under instructions of the Project Coordinator.
- H. Make the following types of submittals to Architect through the Project Coordinator:
  - 1. Requests for Information.
  - 2. Requests for substitution.
  - 3. Shop drawings, product data, and samples.
  - 4. Test and inspection reports.
  - 5. Design data.
  - 6. Manufacturer's instructions and field reports.
  - 7. Applications for payment and change order requests.
  - 8. Progress schedules.
  - 9. Coordination drawings.
  - 10. Correction Punch List and Final Correction Punch List for Substantial Completion.
  - 11. Closeout submittals.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE**

- A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
  - 1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Information (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
  - 2. Contractor and Architect are required to use this service.
  - 3. It is Contractor's responsibility to submit documents in allowable format.
  - 4. Subcontractors, suppliers, and Architect's consultants will be permitted to use the service at no extra charge.
  - 5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, [www.adobe.com](http://www.adobe.com), or Bluebeam PDF Revu, [www.bluebeam.com](http://www.bluebeam.com)), unless such software capability is provided by the service provider.
  - 6. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
  - 7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.
- B. Cost: The Construction Manager's submittal service will be used.
- C. Submittal Service: The selected service is:
  - 1. Procure (866-477-6267): [www.procure.com](http://www.procure.com).
- D. Training: Web-based training sessions are available for all Contractors, Subcontractors, Suppliers, and Owner's representatives.

- E. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

### **3.02 PRECONSTRUCTION MEETING**

- A. Construction Manager will schedule a meeting after Notice of Award.
- B. Attendance Required:
  - 1. Owner.
  - 2. Architect and their consultants.
  - 3. Construction Manager
- C. Agenda:
  - 1. Execution of Owner-Contractor Agreement.
  - 2. Submission of executed bonds and insurance certificates.
  - 3. Distribution of Contract Documents.
  - 4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
  - 5. Designation of personnel representing the parties to Contract and Architect.
  - 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
  - 7. Scheduling.
- D. Construction Manager will record minutes and distribute copies within two days after meeting to participants, Architect, Owner, and those affected by decisions made.

### **3.03 PROGRESS MEETINGS**

- A. Construction Manager will schedule and administer meetings throughout progress of the work at maximum weekly intervals.
  - 1. Provide a virtual meeting setup, including video and audio conferencing capabilities, to allow remote attendance and full participation by all required parties.
- B. Construction Manager will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required as appropriate to agenda topics for each meeting: Job Superintendents, Major Subcontractors and Suppliers, Bid Package Contractor Project Managers, Construction Manager, Owner, and Architect and their consultants.
- D. Agenda:
  - 1. Review minutes of previous meetings.
  - 2. Review of work progress.
  - 3. Field observations, problems, and decisions.
  - 4. Identification of problems that impede, or will impede, planned progress.
  - 5. Review of submittals schedule and status of submittals.
  - 6. Review of RFIs log and status of responses.
  - 7. Review of off-site fabrication and delivery schedules.
  - 8. Maintenance of progress schedule.
  - 9. Corrective measures to regain projected schedules.
  - 10. Planned progress during succeeding work period.
  - 11. Maintenance of quality and work standards.
  - 12. Effect of proposed changes on progress schedule and coordination.
  - 13. Other business relating to work.
- E. Construction Manager will record minutes and distribute copies within two days after meeting to participants, Architect, Owner, and those affected by decisions made.
- F. **Failure to attend meetings will result in holding of payment.**

### **3.04 OWNER ARCHITECT CONSTRUCTION MANAGER (OACM) MEETINGS**

- A. Construction Manager will schedule and administer OACM meetings throughout progress of the work at maximum weekly intervals.
  - 1. Provide a virtual meeting setup, including video and audio conferencing capabilities, to allow remote attendance and full participation by all required parties.
- B. Construction Manager will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required as appropriate to agenda topics for each meeting: Owner Representative, Architect, Engineers, and Construction Manager
- D. Agenda:
  - 1. Review minutes of previous meetings.
  - 2. Review of work progress.
  - 3. Field observations, problems, and decisions.
  - 4. Identification of problems that impede, or will impede, planned progress.
  - 5. Review of submittals schedule and status of submittals.
  - 6. Review of RFIs log and status of responses.
  - 7. Review of off-site fabrication and delivery schedules.
  - 8. Maintenance of progress schedule.
  - 9. Corrective measures to regain projected schedules.
  - 10. Planned progress during succeeding work period.
  - 11. Coordination of projected progress.
  - 12. Maintenance of quality and work standards.
  - 13. Effect of proposed changes on progress schedule and coordination.
  - 14. Other business relating to work.
- E. Construction Manager will record minutes and distribute copies within two days after meeting to participants, Architect, Owner, and those affected by decisions made.

### **3.05 CONSTRUCTION PROGRESS SCHEDULE - SEE SECTION 01 3216**

### **3.06 COORDINATION DRAWINGS**

- A. Provide information required by Project Coordinator for preparation of coordination drawings.
- B. Review drawings prior to submission to Architect.

### **3.07 REQUESTS FOR INFORMATION (RFI)**

- A. Definition: A request seeking one of the following:
  - 1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
  - 2. A resolution to an issue which has arisen due to field conditions and affects design intent.
- B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.
- C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
  - 1. Prepare a separate RFI for each specific item.
    - a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
    - b. Do not forward requests which solely require internal coordination between subcontractors.
  - 2. Prepare using software provided by the Electronic Document Submittal Service.

3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
- D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
  1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
  2. Unacceptable Uses for RFIs: Do not use RFIs to request the following::
    - a. Approval of submittals (use procedures specified elsewhere in this section).
    - b. Approval of substitutions (see Section - 01 6000 - Product Requirements)
    - c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
    - d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).
  3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
- E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
  1. Official Project name and number, and any additional required identifiers established in Contract Documents.
  2. Discrete and consecutive RFI number, and descriptive subject/title.
  3. Issue date, and requested reply date.
  4. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
  5. Annotations: Field dimensions and/or description of conditions which have engendered the request.
  6. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
- F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
- G. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
  1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
  2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.

### **3.08 SUBMITTAL SCHEDULE**

- A. Submit to Architect for review a schedule for submittals in tabular format.
  1. Submit at the same time as the preliminary schedule specified in Section - 01 3216 - Project Construction Schedule.
  2. Coordinate with Contractor's construction schedule and schedule of values.
  3. Format schedule to allow tracking of status of submittals throughout duration of construction.
  4. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.

5. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
  - a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

### **3.09 SUBMITTALS FOR REVIEW**

- A. When the following are specified in individual sections, submit them for review:
  1. Product data.
  2. Shop drawings.
  3. Samples for selection.
  4. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
- C. Samples will be reviewed for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

### **3.10 SUBMITTALS FOR INFORMATION**

- A. When the following are specified in individual sections, submit them for information:
  1. Design data.
  2. Certificates.
  3. Test reports.
  4. Inspection reports.
  5. Manufacturer's instructions.
  6. Manufacturer's field reports.
  7. Other types indicated.
- B. Submit for Architect's knowledge as contract administrator or for Owner.

### **3.11 SUBMITTALS FOR PROJECT CLOSEOUT**

- A. Submit Correction Punch List for Substantial Completion.
- B. Submit Final Correction Punch List for Substantial Completion.
- C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 7800 - Closeout Submittals:
  1. Project record documents.
  2. Operation and maintenance data.
  3. Warranties.
  4. Bonds.
  5. Other types as indicated.
- D. Submit for Owner's benefit during and after project completion.

### **3.12 NUMBER OF COPIES OF SUBMITTALS**

- A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
- B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
  1. After review, produce duplicates.
  2. Retained samples will not be returned to Contractor unless specifically so stated.

### **3.13 SUBMITTAL PROCEDURES**

- A. General Requirements:
  1. Use a single transmittal for related items.

2. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
  3. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
  4. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
    - a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
  5. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
    - a. Upload submittals in electronic form to Electronic Document Submittal Service website.
  6. Schedule submittals to expedite the Project, and coordinate submission of related items.
    - a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
    - b. For sequential reviews involving Architect's consultants, Owner, or another affected party, allow an additional 7 days.
  7. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
  8. Provide space for Contractor and Architect review stamps.
  9. When revised for resubmission, identify all changes made since previous submission.
  10. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
  11. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
  12. Submittals not requested will not be recognized or processed.
- B. Product Data Procedures:
1. Submit only information required by individual specification sections.
  2. Collect required information into a single submittal.
  3. Do not submit (Material) Safety Data Sheets for materials or products.
- C. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
  2. Do not reproduce Contract Documents to create shop drawings.
  3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.
- D. Samples Procedures:
1. Transmit related items together as single package.
  2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.
- E. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
    - a. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.

### **3.14 SUBMITTAL REVIEW**

- A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.
- B. Submittals for Information: Architect will acknowledge receipt, but will take no other action.
- C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
  - 1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.
- D. Architect's and consultants' actions on items submitted for review:
  - 1. Authorizing purchasing, fabrication, delivery, and installation:
    - a. "Approved".
    - b. "Approved as Noted".
      - 1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
  - 2. Not Authorizing fabrication, delivery, and installation:
    - a. "Revise and Resubmit".
      - 1) Resubmit revised item, with review notations acknowledged and incorporated.
      - 2) Non-responsive resubmittals may be rejected.
    - b. "Rejected".
      - 1) Submit item complying with requirements of Contract Documents.
- E. Architect's and consultants' actions on items submitted for information:
  - 1. Items for which no action was taken:
    - a. "For Record Only" - to notify the Contractor that the submittal has been received for record only.

**END OF SECTION**

**SECTION 01 3030  
WORKSITE SAFETY**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. General worksite safety requirements

**1.02 GENERAL NOTES**

- A. Health and safety will always remain the top priority for all levels of management, supervision, and workers engaged in construction activities. Health and safety will never be sacrificed in lieu of schedule, cost, production, or any other component of the work process. Gehrtz Construction Services expects all Contractors to execute their work on this project with a proactive commitment to safety at all levels. Each Contractor should plan their work focusing on protecting their workers from incidents and injuries.
- B. All contractors will incorporate, as a minimum, OSHA 29 CFR 1926 Construction Safety Standards, OSHA 29 CFR 1910 General Industry Standards (as applicable), specific state safety regulations, specific Owner requirements, project safety rules, and this Site-Specific Safety Policies (SSSP) when determining the safe work practices and protection of all workers. If any of these standards, requirements, or procedures conflict, the more stringent requirement shall prevail.
- C. This document is not all encompassing of Gehrtz Construction Services safety policies. Reference the Gehrtz Construction Services Site-Specific Safety Policies for additional information regarding policies and procedures.

**1.03 REFERENCE STANDARDS**

- A. 29 CFR 1910 - Occupational Safety and Health Standards; current edition.
- B. 29 CFR 1910.134 - Respiratory Protection; current edition.
- C. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.
- D. NFPA 70E - Standard for Electrical Safety in the Workplace; 2015.

**1.04 SAFETY TRAINING**

- A. Safety and health training are a requirement and mandatory for all Contractor workers assigned to this project to promote and ensure that an incident and injury free environment exists.
- B. Training:
  - 1. **\*\*\* Each Contractor is responsible for the proper training of their employee(s) in accordance with OSHA 29 CFR 1926 Construction Safety Standards, OSHA 29 CFR 1910 General Industry Standards (as applicable), specific state safety regulations, specific Owner requirements, project safety rules, and this Site-Specific Safety Policy manual. Training records and experience shall be maintained and available for review by Gehrtz Construction Services. \*\*\***

**1.05 DESIGNATED CONTRACTOR COMPETENT PERSON**

- A. Each Contractor will designate a competent person(s), as defined by OSHA 29 CFR 1926.32(f) as "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them", as their project safety representative. This person(s) name will be submitted (pg. 27) to Gehrtz Construction Services and this person(s) must have the authority and responsibility to ensure the proper implementation and enforcement of this SSSP. Two competent people for each category is preferred. **Contractors shall have a competent person(s) on site at all times.**
  - 1. The **General Trades Competent Person/Foreman** designated will be expected to have an adequate knowledge of OSHA construction standards.

2. The **Scaffold Competent Person** designated to oversee erection and dismantling of scaffolds will be expected to have an above average knowledge of OSHA 29 CFR 1926.450 Subpart L - Scaffolds, and proof of qualification training.
  3. The Trenching and Excavation Competent Person designated to oversee digging trenches and excavations will be expected to have an above average knowledge of OSHA 29 CFR 1926.650 Subpart P - Excavations, and proof of qualification training.
  4. The **Fall Protection Competent Person** designated to oversee their company's fall protection plan will be expected to have an above average knowledge of OSHA 29 CFR 1926.500 Subpart M - Fall Protection, and proof of qualification training.
  5. The **Electrical Competent Person** designated to oversee their company's electrical protection plan will be expected to have an above average knowledge of OSHA 29 CFR 1926.400 Subpart K and NFPA 70E - and proof of qualification training.
  6. The **Rigging Qualified Person** designated to oversee the rigging of structural steel, concrete panels, materials, or other equipment hoisted above the ground will be expected to have an above average knowledge of OSHA 29 CFR 1926.251. Competent Person designated for rigging structural steel shall have an above average knowledge of OSHA 29 CFR 1926.753 Hoisting and Rigging, and formal training.
  7. The **Safety Competent Person** designated to oversee the safety of their employees and subcontractors will be expected to have an above average knowledge of OSHA construction standards.
- B. As a minimum, each of these competent persons must:
1. be proficient in the development and execution of pre-task safety plans, competency plans and risk/severity assessments. Audit, document and submit as required.
  2. obtain an OSHA 10-hour certificate from a certified OSHA trainer and a minimum of 3 years' experience as a foreman/competent person. OSHA 30-hour certificate and at least 5 years construction safety training is highly recommended. Experience must be in the non-residential construction industry.
  3. obtain certified competency training conducted by an authorized OSHA certified trainer.
  4. conduct regular safety meetings with workers to instruct them on safe work practices and requirements.
  5. provide timely submission of all safety-related documents.
  6. conduct documented pre-task safety plans and communicate daily to workers to ensure compliance with safe work practices, this Site Safety and Prevention Program and OSHA safety regulations.
- C. For the purposes of the Program, the use of the words "competent person", in any format, is defined pursuant to the OSHA definition as stated above.

## 1.06 PERSONAL PROTECTIVE EQUIPMENT

- A. All personal protective equipment (PPE) shall meet applicable standard of the American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM) and properly used in accordance with the manufactures' recommendations. Each employer shall furnish their employees approved PPE that fits to size and provide training in the selection, use and care of such, retraining to be performed as necessary. Employees must maintain their PPE in good sanitary conditions, if defective or showing signs of excessive wear PPE must be replaced. All person(s) entering the jobsite will ,as a minimum, always wear the following personal protective equipment in the designated work area while on this project (except in office and lunch areas). At no time during the project will PPE requirements be relaxed.
1. Head Protection: An approved type 2 hard hat must always be worn. The employer and employee's name shall be on the front of the hard hat.
  2. Eye and Face Protection
    - a. Safety glasses (Z87.1) with side shields must always be worn.
  3. Workers that wear prescription glasses may do one of the following:
    - a. Obtain prescription safety glasses (Z87.1) with rigid side shields.
    - b. Wear over-the-glass safety glasses.

4. In addition, the following eye/face equipment must be worn when performing the following work activities:
  - a. Arc welding - Welding hood with proper shading.\*
  - b. Burning - Burning goggles with proper shading.
  - c. Grinding or cutting metals - Face shield.\*
  - d. Drilling (rock) - Face shield.\*
  - e. Chemical handling - Face shield.\*
  - f. Molten materials - Face shield.\*
  - g. Corrosive liquids - Face shield.\*
  - h. Concrete pouring - Face shield.\*

Note: \*Safety glasses will be worn in conjunction with face shields & welding hoods.
5. Foot Protection: Above the ankle hard-sole work boots or shoes that are in good condition must always be worn. Safety-toed work boots if worn must conform to ASTM F2412-05 & ASTM F2413-05.

## 1.07 WORK ATTIRE

- A. Clothing
  1. Shirt sleeves will have a minimum length of 4 inches. No shorts, tank tops, or cut-off shirts are permitted.
  2. All personnel shall wear ANSI class II reflective vests or high visibility clothing while in the designated work zone. During the hours of dusk to dawn ANSI class II reflective vests or clothing shall be worn.
  3. Long pants that fit properly around the waist and are of proper length so as not to create a trip hazard.
  4. Long hair must be contained so as not to create a hazard of getting caught.
- B. Respiratory Protection
  1. All Contractors are required to determine if hazards exist that require respiratory protection. If so, the Competent Person must submit a plan to Gehrtz Construction Services prior to the start of work. Respiratory protection would be required if OSHA permissible exposure limits are exceeded, and no means of engineering controls could be used. The subcontractor would be responsible for determining the exposure level by sampling airborne contamination.
  2. When respiratory protection is required, the employer must establish a comprehensive respiratory protection program, as outlined in OSHA's Small Entity Compliance Guide for Respiratory Protection, and as required in the OSHA respiratory protection standard 29 CFR 1910.134 and 29 CFR 1926.103.
  3. Use of Respirators: As the primary means of preventing or minimizing exposures to airborne contaminants, use effective source controls such as substitution, automation, enclosed systems, local exhaust ventilation or wet methods.
- C. Hearing Protection: Approved hearing protection will be worn as specified in posted areas and while working with or around high-noise level producing machines, tools, or equipment. A good rule to follow is: When you must raise your voice to be heard, you need hearing protection. Exposure to impulsive or impact noise must not exceed 140dB noise level. Wired and Wireless earphones are not permitted as hearing protection.
- D. Hand Protection: Workers will wear an appropriate level of hand protection as necessary and as determined by the Competent Person to prevent hand and finger injuries.
- E. Additional Protections: Specific activities may require that additional personal protective equipment be worn such as working on energized circuits. Contractors and their Competent Persons shall evaluate the need for additional protection based on their pre-task safety plan.
- F. Hand and Power Tools: All hand and power tools will be operated, kept in good condition, and regularly maintained per manufacturer's recommendations. Workers working 6 feet or greater above a lower level while using handheld tools and or power tools that may be subject to

dropping shall be tethered or area barricaded to prevent tools from hitting unsuspected workers below.

#### 1.08 DEMOLITION

- A. Demolition plans shall follow OSHA 29 CFR 1926 Subpart T.
- B. Prior to the start of any demolition work, an engineering survey of the building or area to be demolished is required to determine the condition of the area. Debris and material shall not be dropped through walls, floor holes, windows, or other elevated work areas without the area below being barricaded and proper signs posted.
- C. Debris chutes shall have a substantial gate at all elevated openings.
- D. Gehrtz Construction Services may require the demolition Contractor to submit a site-specific fall protection plan if the work requires the removal of exterior walls and or flooring.

#### 1.09 CRANE SAFETY, RIGGING AND HOISTING OPERATIONS

- A. Any Contractor who uses a crane on the Project Site shall adhere to the requirements of 29 CFR 1926.1400 Cranes and Derricks in Construction and ASME B30. All crane operators shall provide required documentation such as annual inspection certification, operator's license, and signalman training when requested.
- B. Each qualified crane operator will be responsible for conducting a detailed daily inspection of their crane and ensuring findings are properly logged in a written daily report.

#### 1.10 FALL PROTECTION

- A. All individuals will take all practical measures to eliminate, prevent, and control fall hazards. All work will be planned with the intent to eliminate identified and potential fall hazards. Gehrtz Construction Services fall protection policy and OSHA 29 CFR 1926.500 Subpart M govern the requirements to protect workers exposed to falls. Gehrtz Construction Services fall protection policy is 100% fall protection when exposed to 6 feet or greater above a lower level. The use of conventional fall protection systems (passive preferred) shall be utilized to protect workers from falls to lower levels. Workers wearing personal fall arrest systems shall not free fall more than 6 feet or contact a lower level.
- B. A written fall protection and prevention plan, including a rescue plan as applicable, may be required as deemed necessary by Gehrtz Construction Services. Contractors engaged in the following shall submit their fall protection plan for approval prior to beginning work on site: Steel erection, concrete (cast in place), wood framing, dry laid masonry wall (segmented), pre-cast concrete walls, tilt-up concrete walls, and roofing work. The plan must be agreed to prior to beginning work and the designated competent person must enforce said plan.
- C. Acceptable fall protection systems include the following conventional systems: guardrails, safety netting, floor and wall hole covers, positioning device systems, fall restraint systems, protection from falling objects and personal fall arrest systems.
  - 1. **\*\*\*Gehrtz Construction Services does not allow the higher regulatory thresholds for fall protection systems found in Subpart R Steel Erection, Subpart L Scaffold, or Subpart Q Concrete and Masonry, including Pre-Cast Concrete. Safety monitoring system is prohibited.\*\*\***
- D. Workers exposed to fall hazards shall be uniformly equipped, trained, and given periodic refresher training in fall protection at specific intervals to minimize the adverse effects of accidental falls. Fall protection training records will be maintained on the project and available for review by Gehrtz Construction Services.

#### 1.11 HAZARDOUS COMMUNICATIONS/SDS

- A. All Contractors will submit their hazardous communication program and SDS to Gehrtz Construction Services prior to the start of work. Each Contractor must supervise employees under their direct supervision for proper training and proper precautions prior to the hazardous chemical's introduction to the jobsite.

### **1.12 HOT WORK PERMIT REQUIREMENTS**

- A. A Hot Work Permit is required for any temporary operation involving open flames or producing heat and/or sparks. This includes, but is not limited to brazing, flame cutting, grinding, soldering, torch applied roofing and welding. Hot Work Permits will be issued by Gehrtz Construction Services and will be filled out by the Contractor engaged in hot work operations in an enclosed building/structure.
- B. All provisions of the Hot Work Permit will be followed including fire watch personnel. Hot Work Permits can be issued for the duration of the hot work but not to exceed the work shift.

### **1.13 HOUSEKEEPING AND ORDERLINESS**

- A. All people shall always maintain their work locations in an orderly and clean manner. Daily cleanup of work areas is mandatory for all.
- B. Gehrtz Construction Services Cleanliness Standard:
  - 1. Dumpsters for general trash, construction debris (wood, metal, concrete... etc.) and recycling will be provided pursuant to contract requirements. Contractors shall provide trash containers on site for general trash and debris. All miscellaneous trash generated by workers shall be deposited in a container or in the back of pickup trucks daily. Do not throw bottles, food wrappers, cups, or any other types of trash on the floor or ground. When containers are 3/4 full, they will be either removed from the site or dumped in a large metal dumpster. Contractors, as required by contract, will provide their own dumpsters for their specific excess materials, and allocate adequate resources to ensure the housekeeping standard is maintained throughout their time on the project. Gehrtz Construction Services shall address this housekeeping standard with all subcontractors prior to beginning work.
- C. General Housekeeping Requirements:
  - 1. Housekeeping is an important part of daily work. All materials, equipment, etc. brought on site shall be organized and stored in areas designated by Gehrtz Construction Services. Trade partners are responsible for organizing material, equipment, and tools so they do not create tripping hazards or impede/block exits. Trade partners are responsible for the daily clean-up of excess material and debris which shall be deposited in appropriate containers throughout the day. When work is completed in a room or area, all excess material and debris shall be removed and broom cleaned.

### **1.14 LADDER SAFETY**

- A. Gehrtz Construction Services requires all portable ladders to be rated heavy duty Type 1, 1A, or 1AA. Type II or Type III Ladders (<225 Lbs.) & all types of aluminum ladders are prohibited. Job-made ladders shall comply with ANSI A14.4 1979 and 2009 as well as OSHA 29 CFR 1926 Subpart X. Contractor Competent Person shall evaluate the use of person fall protection systems while on ladders great than 6 feet above the finished floor the ladder sits on.
- B. If working on a ladder near an edge or opening, the employee shall be a distance equal to the height of the ladder plus four feet from the edge or opening or use a fall arrest or restraint system to prevent a greater fall distance.
- C. Refer to manufacturer's specifications for the proper use of all ladders.

### **1.15 STEEL ERECTION**

- A. The steel erection Contractor shall submit a written steel erection plan to Gehrtz Construction Services prior to any work being performed. The plan must be comprehensive and include all aspects of the erection process, including but not limited to storage/staging of materials, equipment for hoisting materials, routes for lifting operations, critical lifts, rigging procedures, connection procedures, erection bridging procedures, stability requirements, fall protection requirements, decking procedures, and proper training of workers. Steel erection procedures shall follow OSHA 29 CFR 1926.750 Subpart R - Steel Erection Standard and any supplemental requirements required by Gehrtz Construction Services. The following requirements shall be incorporated in the plan:

1. 100% continuous fall protection for heights 6 feet or greater above a lower level. Workers engaged in steel erection activities to include connecting, bolt-up and decking are not exempt from the project's 100% fall protection requirements.
2. During skeletal steel erection, a tightly planked temporary floor shall be maintained within 2 stories or 30 feet, whichever is less, below, and directly under that portion of each tier of beams on which any work is being performed.
3. During structural steel assembly, a safety railing of wire rope (at least 3/8" dia.) or equivalent shall be installed. The top railing should be 45 inches and a mid-railing at 22 inches above the deck along all open sides including stairway landings and elevator shafts. The railing must support 200 lbs. of downward force and not deflect below 39 inches and shall not deflect outward beyond the edge of the floor. Flagging must be placed no more than every 6 feet apart using a hi-visibility material.
4. When placing structural steel members, the load shall not be released from the hoisting line until the member is secured by at least two bolts or the equivalent at each connection, drawn up wrench tight.

### **1.16 TRENCHING & EXCAVATION SAFETY**

- A. The following regulations apply to all trenching and excavation activities on this site: OSHA 29 CFR 1926 Subpart P.
  1. Any Contractor engaged in trenching operations deeper than 5 feet shall designate a Competent Person and inform Gehrtz Construction Services.
  2. Underground utilities must be located.
  3. Trenches or excavations greater than 5 feet in depth shall be sloped, benched, or otherwise protected from cave-ins as determined by the Competent Person. Sloping, benching or other protective systems are recommended for any trenches and excavations over 3 feet in depth.
  4. Protective systems designed to be placed in trenches such as trench boxes must have tabulated data available for review as necessary. Trench boxes shall have permanent identification to link it to manufacturer's tabulated data.
  5. Spoil piles and other materials will be placed a minimum of 2 feet from the edges of all trenches and excavations.
  6. In trenches deeper than 4 feet, locate means of egress, such as ladders or steps or ramps (45-degree slope), so they are no more than 25 feet of travel from anyone in the trench.
  7. The Competent Person must inspect all trenches daily before work begins and after every rainstorm or other hazardous conditions. A Competent Person shall be onsite during trenching and excavating activities.
  8. A registered professional engineer must design all excavation and protective systems over 20 feet in depth.

### **1.17 UNDERGROUND UTILITY LOCATIONS**

- A. Any Contractor who digs a trench or excavation shall call the State appropriate 811 service. Before digging, be sure that all utilities have responded to the locate request.

### **1.18 DOCUMENTS**

- A. **This document is not all encompassing of Gehrtz Construction Services safety policies.**  
**Reference:**
  1. **Gehrtz Construction Services Site-Specific Safety Policies (SSSP),**
  2. **OSHA 29 CFR 1926 Construction Safety Standards,**
  3. **OSHA 29 CFR 1910 General Industry Standards (as applicable),**
  4. **Your company's safety policies and procedures,**
  5. **Specific State safety regulations,**
  6. **Specific Owner requirements,**
- B. **for additional information regarding policies and procedures. If any of these standards, requirements, or procedures conflict, the more stringent requirement shall prevail.**

**PART 2 PRODUCTS - NOT USED**  
**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

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**SECTION 01 3216  
PROJECT CONSTRUCTION SCHEDULE**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. General Construction Timeline
  - 1. Construction Start Date: 06-01-2026.
  - 2. Construction Completion: 08-15-2026.
    - a. The entire project must be fully completed including major punch list items.
    - b. In no case will the deadline be extended.
  - 3. Refer to the Construction Schedule included herein for intermediate completion dates for bid package work.
- B. Project Construction
  - 1. The Construction Schedule will become part of each Contractor's contract.
  - 2. There are no liquidated damages or penalties associated with any of the contracts for this project. However, each Contractor will be contractually required to commit adequate resources, both on-site and administrative, to ensure timely delivery of materials, equipment, and labor necessary to meet the Construction Schedule. If during the course of the construction period a Contractor is unable to confirm their ability to meet the Construction Schedule or has demonstrated the same, the Owner reserves the right to terminate the contract and, if possible, secure another Contractor that can meet the Construction Schedule.
  - 3. Time and Personnel: Each bidder shall include in their proposal adequate provisions for time and personnel to meet the Construction Schedule which could include overtime if necessary.
  - 4. Material and Equipment Delivery: If the delivery time for any material or equipment indicated on the drawings or specified herein is anticipated by a bidder to pose a risk to meeting the Construction Schedule, the bidder is asked to contact the Construction Manager immediately so that any necessary adjustments can be made to maintain the Schedule.
  - 5. Material Storage: Deliver materials only as needed for each day's work to be completed, or as agreed upon by the Construction Manager. Site storage space will be limited.
  - 6. The Architect will make every effort to expedite the project through prompt review of shop drawings, early decisions regarding construction questions, and any other assistance that can be offered the Contractors during the construction process.

**1.02 SUBMITTALS**

- A. Within 10 days after date of Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.
- B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
  - 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- D. Within 10 days after joint review, submit complete schedule.
- E. Submit updated schedule with each Application for Payment.
- F. Submit in PDF format.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 CONTENT**

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by specification section number.
- C. Identify work of separate stages and other logically grouped activities.
- D. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- E. Indicate delivery dates for owner-furnished products and products identified under Allowances.
- F. Provide legend for symbols and abbreviations used.

**3.02 UPDATING SCHEDULE**

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity.
- C. Annotate diagrams to graphically depict current status of Work.
- D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- E. Indicate changes required to maintain Date of Substantial Completion.
- F. Submit reports required to support recommended changes.

**END OF SECTION**





**SECTION 01 4000  
QUALITY REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Submittals.
- B. Quality assurance.
- C. References and standards.
- D. Testing and inspection agencies and services.
- E. Contractor's construction-related professional design services.
- F. Contractor's design-related professional design services.
- G. Control of installation.
- H. Mock-ups.
- I. Tolerances.
- J. Manufacturers' field services.
- K. Defect Assessment.

**1.02 RELATED REQUIREMENTS**

- A. Document 00 7200 - General Conditions: Inspections and approvals required by public authorities.
- B. Section 01 3000 - Administrative Requirements: Submittal procedures.
- C. Section 01 4216 - Definitions.
- D. Section 01 6000 - Product Requirements: Requirements for material and product quality.

**1.03 REFERENCE STANDARDS**

- A. ACI SPEC-301 - Specifications for Concrete Construction; 2020.
- B. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2025.
- C. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)); 2012 (Reapproved 2021).
- D. ASTM D1556/D1556M - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method; 2024.
- E. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2023.
- F. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2025b.

**1.04 CONTRACTOR'S CONSTRUCTION-RELATED PROFESSIONAL DESIGN SERVICES**

- A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.
- B. Provide such engineering design services as may be necessary to plan and safely conduct certain construction operations, pertaining to, but not limited to the following:
  - 1. Temporary sheeting, shoring, or supports.
  - 2. Temporary scaffolding.
  - 3. Temporary bracing.
  - 4. Temporary foundation underpinning.
  - 5. Temporary stairs or steps required for construction access only.
  - 6. Temporary hoist(s) and rigging.
  - 7. Investigation of soil conditions to support construction equipment.

### **1.05 CONTRACTOR'S DESIGN-RELATED PROFESSIONAL DESIGN SERVICES**

- A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.
- B. Base design on performance and/or design criteria indicated in individual specification sections.

### **1.06 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Test Reports: After each test/inspection, promptly submit electronic copies of report to Architect, Construction Manager, and Contractor.
  - 1. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.
  - 2. All test results and reports, including those the Owner does not pay additional for, shall become the property of the Owner .
- C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
  - 1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

### **1.07 QUALITY ASSURANCE**

- A. Testing Agency Qualifications:
  - 1. Prior to start of work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.

### **1.08 TESTING AND INSPECTION AGENCIES AND SERVICES**

- A. The Owner, with the assistance of the Construction Manager, shall arrange for all tests expressly required by the Contract Documents, as well as any inspections mandated by applicable governmental authorities. The Owner further reserves the right to require additional tests at its discretion.
  - 1. If any such test indicates that the materials furnished or the work performed by the Contractor/Subcontractor fail to comply with the requirements of the Contract Documents, the Contractor/Subcontractor shall bear the full cost of the initial test, any subsequent retests, and any additional inspections necessitated by such noncompliance.
  - 2. Conversely, if the test results demonstrate compliance with the Contract Documents, the Owner shall bear the costs associated with those tests and inspections.
- B. The cost of the following tests are to be paid for by the Owner:
  - 1. Concrete Work: Slump tests, 7 day and 28 day compressive strength of concrete. See the most recent version of ACI SPEC-301.
  - 2. Concrete Grout.
  - 3. Mortar.
  - 4. Structural Frame: Tests as specified in 05 1200 - Structural Steel Framing.
  - 5. Earthwork: Compaction of interior and exterior fill and backfill material.
  - 6. Site Utility: Compaction of site utility fill material.
  - 7. Paving and Surfacing: Compaction of fill below surface.
  - 8. Asphalt: Density tests at base course and wear course.
- C. The cost of the following tests are to be paid for by the Contractor completing the work:
  - 1. Concrete Mix Designs for each type of concrete used.
  - 2. Grout Mix Design for each type of grout used.

3. Mortar Mix Design for each type of mortar used.
  4. Fire Sprinkler Test: Provide air and water test as per local code requirements. See Spec Division 21.
  5. Plumbing Piping: Provide air test as per local code requirements. See Spec Division 22.
  6. Ventilation and Air Conditioning: Provide air test on ductwork as per local code requirements. See Spec Division 23.
  7. Fire Alarm Test: Certify that fire alarm system works in accordance with specifications. See Spec Division 28.
- D. The cost of the following inspections (See Structural) are to be paid for by the Owner:
1. Concrete reinforcement and formwork.
  2. Masonry: Reinforcement, grout placement, and installation.
  3. Structural steel / deck fastening.
- E. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- F. Contractor Employed Agency:
1. Inspection agency: Comply with requirements of ASTM D3740 and ASTM E329.

### 1.09 FIELD TESTS

- A. Concrete
1. See Structural Drawings - General Notes.
  2. All tests indicated in ACI SPEC-301 are required.
  3. Do not test the third cylinder (28 day) unless a deficient result is obtained in the other two.
  4. Make at least one strength test for each 100 cubic yards, or fraction thereof, of each mixture design placed in any one day.
  5. See Structural Drawings for formwork, reinforcement, and concrete placement.
- B. Concrete Grout
1. See Structural Drawings - General Notes.
  2. Provide concrete grout mixes of each type used.
  3. Provide testing at all areas, including masonry walls and below steel columns.
  4. See Structural Drawings for continuing and periodic inspection.
- C. Mortar for Masonry Units
1. See Structural Drawings - General Notes.
  2. Provide mortar mixes of each type of mortar used.
  3. See Structural Drawings for continuing and periodic inspection.
- D. Structural Frame
1. See Structural Drawings - General Notes.
  2. Provide testing of the structural frame.
    - a. Non-slip critical bolted connections shall be visually inspected at the rate of 100% of all connections. At least 10% shall be field tested for proper bolt torque.
    - b. All full penetration welds at or exceeding 5/16 inch shall be ultrasonic tested. All full penetration welds less than 5/16 inch shall be magnetic particle tested.
    - c. Fillet welds shall be visually inspected, with a minimum of 10% of all welded connections field-verified for dimensional compliance, including weld plates at concrete planks and/or panels.
    - d. See Structural Drawings for stud shear connector weld testing.
    - e. See Structural Drawings for expansion bolt and adhesive anchor testing.
- E. Earthwork / Demolition
1. COMPACTION REQUIREMENTS SCHEDULE: Compact and test subgrade and fill materials to achieve the minimum percentage of maximum dry density determined in accordance with ASTM D698 (Standard Proctor), Method C or Method D.
    - a. Review local municipality/county/state requirements.

- b. See Structural Drawings - General Notes.
  - c. See requirements in individual specification sections.
  - 2. Field density test reports shall clearly identify the following information for each test:
    - a. Horizontal and vertical location of test.
    - b. Material type being tested.
    - c. Proctor test method.
    - d. Maximum proctor density.
    - e. Specified density.
    - f. Optimum moisture content.
    - g. Field test method.
    - h. Actual moisture content.
    - i. Tested density.
    - j. Pass/fail indication.
  - 3. Do not submit reports of failing tests without follow-up report of reworked area and passing retest. Submitted test reports without specified information will be returned for revisions and resubmittal.
- F. Paving and Surfacing
- 1. Asphalt Surface and Base Course
    - a. One density test shall be taken on the surface course at a random location.
    - b. One density test shall be taken on the base course at a random location.
    - c. Aggregate Base Course: Same number of density tests.
    - d. The Contractor shall also furnish samples of the material used to an independent testing laboratory to determine the gradation, bituminous content, and stability.
  - 2. ASTM D698, Test for moisture-density relations of soils (Proctor Method).
  - 3. ASTM D1556/D1556M, Test for density of soil in place (Sand Cone Method).
  - 4. ASTM C94/C94M, Ready-mixed concrete. See concrete test requirements.

## **PART 2 PRODUCTS - NOT USED**

## **PART 3 EXECUTION**

### **3.01 CONTROL OF INSTALLATION**

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

### **3.02 MOCK-UPS**

- A. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.
- B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mock-ups will be used as a comparison standard for the remaining Work.

- D. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

### **3.03 TOLERANCES**

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

### **3.04 TESTING AND INSPECTION**

- A. Testing Agency Duties:
  - 1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
  - 2. Perform specified sampling and testing of products in accordance with specified standards.
  - 3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
  - 4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
  - 5. Perform additional tests and inspections required by Architect.
  - 6. Attend preconstruction meetings and progress meetings.
  - 7. Submit reports of all tests/inspections specified.
- B. Limits on Testing/Inspection Agency Authority:
  - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
  - 2. Agency may not approve or accept any portion of the Work.
  - 3. Agency may not assume any duties of Contractor.
  - 4. Agency has no authority to stop the Work.
- C. Contractor Responsibilities:
  - 1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
  - 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
  - 3. Provide incidental labor and facilities:
    - a. To provide access to Work to be tested/inspected.
    - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
    - c. To facilitate tests/inspections.
    - d. To provide storage and curing of test samples.
  - 4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
    - a. If the Architect is not notified as stated above and the Contractor proceeds with the work, the Architect shall have the authority to direct the Contractor to remove part or all of the installed materials at the Contractor's expense for detailed observation.
    - b. The respective Contractor and/or subcontractor shall correct any deficiencies that may be observed. Construction work observations, or lack thereof, by the Architect does not relieve the Contractor and/or subcontractor from any liability of faulty workmanship that may have occurred or may occur at a later date.
    - c. The Architect shall be notified at the following points of work:
      - 1) Footing bottoms and concrete reinforcement prior to pouring any concrete.
      - 2) Vapor barrier prior to concrete slab installation.

- 3) Water drainage test on sloped concrete surfaces prior to finish floor material installation.
  - 4) Waterproofing/dampproofing prior to any backfilling work.
  - 5) Mechanical and Electrical systems above ceiling inspection prior to installation of finish ceiling material.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
  6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- D. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.
  - E. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

### **3.05 MANUFACTURERS' FIELD SERVICES**

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

### **3.06 DEFECT ASSESSMENT**

- A. Replace Work or portions of the Work not complying with specified requirements.
- B. If, in the opinion of Architect, it is not practical to remove and replace the work, Architect will direct an appropriate remedy or adjust payment.

**END OF SECTION**

**SECTION 01 4216  
DEFINITIONS**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This section supplements the definitions contained in the General Conditions.
- B. Other definitions are included in individual specification sections.

**1.02 DEFINITIONS**

- A. Furnish: To supply, deliver, unload, and inspect for damage.
- B. Install: To unpack, assemble, erect, apply, place, finish, cure, protect, clean, start up, and make ready for use.
- C. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.
- D. Project Manual: The book-sized volume that includes the procurement requirements (if any), the contracting requirements, and the specifications.
- E. Provide: To furnish and install.
- F. Supply: Same as Furnish.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

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**SECTION 01 5000  
TEMPORARY FACILITIES AND CONTROLS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Temporary utilities.
- B. Temporary sanitary facilities.
- C. Temporary Controls: Barriers and enclosures.
- D. Security requirements.
- E. Vehicular access and parking.
- F. Waste removal facilities and services.

**1.02 DEWATERING**

- A. Provide temporary means and methods for dewatering all temporary facilities and controls.
  - 1. Each Contractor and/or Subcontractor is responsible for dewatering their own work areas.
- B. Maintain temporary facilities in operable condition.

**1.03 TEMPORARY UTILITIES**

- A. Owner will provide the following:
  - 1. Electrical power, consisting of connection to existing facilities.
  - 2. Water supply, consisting of connection to existing facilities.
- B. Use trigger-operated nozzles for water hoses, to avoid waste of water.

**1.04 TEMPORARY LIGHT AND POWER SPECIFICS**

- A. The Electrical Contractor shall provide temporary lighting during construction as follows:
  - 1. Lighting Requirements:
    - a. A minimum of one (1) 300-watt lamp shall be provided for every 900 square feet of building area.
    - b. For any room with an area less than 900 square feet, a minimum of one (1) 300-watt lamp shall be installed.
  - 2. Installation and Maintenance:
    - a. The Electrical Contractor shall furnish, install, and maintain all lamps and associated sockets.
    - b. All temporary lighting shall be kept in proper working order for the duration of the construction period.
- B. Each contractor and subcontractor shall furnish their own extension cords, equipped with proper ground-fault protection.
- C. Use of Permanent Electrical Systems for Temporary Power
  - 1. When permanent distribution panels, outlets, and related equipment have been installed and energized, the Electrical Contractor may extend temporary wiring from these permanent systems as required. Under no circumstances shall permanent, specified lighting fixtures be used for temporary lighting unless written approval is obtained from the Construction Manager.
- D. The cost of electrical power consumed from both temporary and permanent services during construction shall be borne by the Owner , consisting of connection to existing facilities.
  - 1. All contractors shall be responsible for diligently supervising the use of electricity and temporary lighting. Abuse or waste of electrical power or lamps may be grounds for a back charge to the responsible contractor, as determined by the Construction Manager.
- E. In the event of any dispute regarding the quantity of temporary wiring or lamps required, the Construction Manager shall be the sole authority to determine the necessary amount.

#### **1.05 TEMPORARY SANITARY FACILITIES (BY CONSTRUCTION MANAGER )**

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Use of existing facilities is not permitted.
- C. New permanent facilities may not be used during construction operations.
- D. Maintain daily in clean and sanitary condition.
- E. At end of construction, return facilities to same or better condition as originally found.

#### **1.06 BARRIERS (BY BID PACKAGE 6A )**

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Provide protection for plants designated to remain. Replace damaged plants.
- D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

#### **1.07 INTERIOR ENCLOSURES (BY BID PACKAGE 6A)**

- A. Provide temporary partitions as indicated to separate 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. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:

#### **1.08 SECURITY**

- A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.
- B. Each individual contractor shall provide security for their own equipment and materials.
- C. Each Contractor shall be responsible for removing all ladders and similar means of access to the Work under their control at the conclusion of each working day. All building entrances and access points shall be securely barricaded or locked daily to prevent unauthorized entry, as directed by the Construction Manager or by a Contractor designated by the Construction Manager.
- D. Coordinate with Owner's security program.

#### **1.09 VEHICULAR ACCESS AND PARKING**

- A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
- B. Coordinate access and haul routes with governing authorities and Owner.
- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Provide means of removing mud from vehicle wheels before entering streets.
- E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

#### **1.10 WASTE REMOVAL**

- A. See Section 01 7000 - Execution and Closeout Requirements for requirements.

#### **1.11 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS**

- A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.
- B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.

- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing facilities used during construction to original condition.
- E. Restore new permanent facilities used during construction to specified condition.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

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**SECTION 01 6000  
PRODUCT REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. General product requirements.
- B. Sustainable design-related product requirements.
- C. Re-use of existing products.
- D. Transportation, handling, storage and protection.
- E. Product option requirements.
- F. Substitution limitations.
- G. Procedures for Owner-supplied products.
- H. Maintenance materials, including extra materials, spare parts, tools, and software.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 4000 - Quality Requirements: Product quality monitoring.
- B. Section 01 7419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

**1.03 SUBMITTALS**

- A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
  - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

**PART 2 PRODUCTS**

**2.01 EXISTING PRODUCTS**

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.
- B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.
- C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

**2.02 NEW PRODUCTS**

- A. Provide new products unless specifically required or permitted by Contract Documents.
- B. See Section 01 4000 - Quality Requirements, for additional source quality control requirements.
- C. Use of products having any of the following characteristics is not permitted:
  - 1. Containing lead, cadmium, or asbestos.
- D. Provide interchangeable components by the same manufacture for components being replaced.

### **2.03 PRODUCT OPTIONS**

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

### **2.04 MAINTENANCE MATERIALS**

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.

## **PART 3 EXECUTION**

### **3.01 SUBSTITUTION LIMITATIONS**

- A. Any item referenced to a Commercial Standard, Federal Specification, trade association standard, or similar standard shall meet the latest applicable requirements for design, manufacture, and installation in effect as of the date of the Advertisement or Invitation for Bids. If this specification calls for a higher level of quality than the referenced standard, this specification shall take precedence.
- B. Where a proprietary material or method is specified for a particular use, the intent is to define a standard of quality, performance, or size, and not to exclude other products of equal or superior merit.
  - 1. For the items specified above, bids shall be based on the products identified in the specifications or on products designated by the Architect via addendum as approved equals. A product named in the specifications or by addendum will be acceptable only if it meets all requirements of the specifications, including the manufacturer's specifications in effect on the date of the Advertisement or Invitation for Bids. Requests for approval of a product as an equal will not be considered unless sufficient data is submitted for the Architect to properly evaluate it. In reviewing such requests, the Architect will consider delivery time, service availability, and the product itself in determining approval under this provision.
- C. Submitting a request for substitution represents that the submitter:
  - 1. Has evaluated the proposed product and determined that it meets or exceeds the specified product's quality standards.
  - 2. Agrees to provide the same warranty for the substitution as is required for the specified product.
  - 3. Will coordinate installation and make any necessary modifications to related Work to ensure completion without additional cost to the Owner.
  - 4. Waives any claims for additional cost or time extensions that may later arise from the substitution.
- D. Substitution Submittal Procedure (after contract award):
  - 1. Submit two copies of each substitution request for review. Each request shall address only one proposed substitution.
  - 2. Provide shop drawings, product data, and certified test results demonstrating the proposed product's equivalence. The proposer is responsible for proving equivalency.

### **3.02 OWNER-SUPPLIED PRODUCTS**

- A. See Section 01 2600 - Work by Others for individual responsibilities.

### **3.03 TRANSPORTATION AND HANDLING**

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

- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

#### **3.04 STORAGE AND PROTECTION**

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 7419.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- G. Comply with manufacturer's warranty conditions, if any.
- H. Do not store products directly on the ground.
- I. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- J. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- K. Prevent contact with material that may cause corrosion, discoloration, or staining.
- L. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- M. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

**END OF SECTION**

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**SECTION 01 7000  
EXECUTION AND CLOSEOUT REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.
- C. Pre-installation meetings.
- D. Cutting and patching.
- E. Surveying for laying out the work.
- F. Cleaning and protection.
- G. Starting of systems and equipment.
- H. Demonstration and instruction of Owner personnel.
- I. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
- J. General requirements for maintenance service.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 3030 - Worksite Safety: General worksite safety requirements.
- B. Section 01 5000 - Temporary Facilities and Controls: Temporary exterior enclosures.
- C. Section 01 5000 - Temporary Facilities and Controls: Temporary interior partitions.
- D. Section 01 9113 - General Commissioning Requirements: Contractor's responsibilities in regard to commissioning.

**1.03 REFERENCE STANDARDS**

- A. 29 CFR 1910 - Occupational Safety and Health Standards; Current Edition.
- B. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
  - 1. On request, submit documentation verifying accuracy of survey work.
  - 2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
  - 3. Submit surveys and survey logs for the project record.
- C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
  - 1. Structural integrity of any element of Project.
  - 2. Integrity of weather exposed or moisture resistant element.
  - 3. Efficiency, maintenance, or safety of any operational element.
  - 4. Visual qualities of sight exposed elements.
  - 5. Work of Owner or separate Contractor.
- D. Project Record Documents: Accurately record actual locations of capped and active utilities.

**1.05 QUALIFICATIONS**

- A. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained

and experienced in collecting and recording accurate data relevant to ongoing construction activities,

- B. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in the State in which the Project is located. Employ only individual(s) trained and experienced in establishing and maintaining horizontal and vertical control points necessary for laying out construction work on project of similar size, scope and/or complexity.
- C. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

#### **1.06 PROJECT CONDITIONS**

- A. Use of explosives is not permitted.
- B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- D. Perform dewatering activities, as required, for the duration of the project.
- E. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- F. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
  - 1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.
  - 2. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.
- G. Erosion and Sediment Control: See Section 01 5713 - Temporary Erosion and Sediment Control.
- H. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
- I. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

#### **1.07 SAFETY**

- A. See Section 01 3030 - Worksite Safety for general worksite safety requirements.
- B. Each contractor is responsible for the safety of their own personnel. At a minimum, all contractors shall comply with OSHA 29 CFR 1926 Construction Safety Standards, OSHA 29 CFR 1910 General Industry Standards (as applicable), applicable state safety regulations, Owner safety requirements, project safety rules, and the Site-Specific Safety Policies (SSSP) when establishing safe work practices and protecting all workers.
  - 1. If any of these standards, requirements, or procedures conflict, the more stringent requirement shall prevail.
- C. Each contractor shall submit their Hazard Communication Program and Safety Data Sheets (SDS) to the Construction Manager prior to the start of work. Contractors shall ensure that employees receive proper training and supervision, and that necessary precautions are taken before any hazardous chemicals are brought onto the jobsite. Contractors are also responsible for maintaining accessible SDS files for their employees, subcontractors, sub-subcontractors, and onsite suppliers.
- D. Each contractor shall submit documentation of an Employer Safety Program that complies with current OSHA regulations and requirements prior to beginning any contract work.

- E. The contractor, along with all subcontractors, sub-subcontractors, and suppliers, shall take all necessary precautions to ensure the safety of the public and all workers on the job, and to prevent accidents or injuries to any persons on, about, or adjacent to the worksite. The contractor and all tiers of subcontractors and suppliers shall comply with Federal and State OSHA regulations, as well as all applicable laws, codes, ordinances, and safety regulations relating to accident prevention and worker protection.
- F. Each contractor shall designate a competent person, as defined in OSHA 29 CFR 1926.32(f), meaning an individual who is capable of identifying existing and predictable hazards in the work environment and has the authority to take prompt corrective action to eliminate them, to serve as the contractor's project safety representative.

## **1.08 COORDINATION**

- A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Notify affected utility companies and comply with their requirements.
- C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and clean-up of work of separate sections.
- 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**

### **2.01 PATCHING MATERIALS**

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000 - Product Requirements.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

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

### **3.02 PREPARATION**

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

### **3.03 PREINSTALLATION MEETINGS**

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
  - 1. Review conditions of examination, preparation and installation procedures.
  - 2. Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

### **3.04 LAYING OUT THE WORK**

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Architect of any discrepancies discovered.
- C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
- F. Utilize recognized engineering survey practices.
- G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
  - 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
  - 2. Grid or axis for structures.
  - 3. Building foundation, column locations, ground floor elevations.
- H. Periodically verify layouts by same means.
- I. Maintain a complete and accurate log of control and survey work as it progresses.

### **3.05 GENERAL INSTALLATION REQUIREMENTS**

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- E. Make neat transitions between different surfaces, maintaining texture and appearance.

### 3.06 ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
  - 1. Verify that construction and utility arrangements are as indicated.
  - 2. Report discrepancies to Architect before disturbing existing installation.
  - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
  - 1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 5000 in locations indicated on drawings.
- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
  - 1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
  - 2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.
- D. Remove existing work as indicated and as required to accomplish new work.
  - 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
  - 2. Remove items indicated on drawings.
  - 3. Relocate items indicated on drawings.
  - 4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
  - 5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
  - 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
  - 2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
  - 3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
    - a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
    - b. Provide temporary connections as required to maintain existing systems in service.
  - 4. Verify that abandoned services serve only abandoned facilities.
  - 5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.
- F. Protect existing work to remain.
  - 1. Prevent movement of structure; provide shoring and bracing if necessary.
  - 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
  - 3. Repair adjacent construction and finishes damaged during removal work.
- G. Adapt existing work to fit new work: Make as neat and smooth transition as possible.

1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
  2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
  3. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.
  4. Trim existing wood doors as necessary to clear new floor finish. Refinish trim as required.
- H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- I. Refinish existing surfaces as indicated:
1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
  2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
- J. Clean existing systems and equipment.
- K. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
- L. Do not begin new construction in alterations areas before demolition is complete.
- M. Comply with all other applicable requirements of this section.

### **3.07 CUTTING AND PATCHING**

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. See Alterations article above for additional requirements.
- C. Perform whatever cutting and patching is necessary to:
1. Complete the work.
  2. Fit products together to integrate with other work.
  3. Provide openings for penetration of mechanical, electrical, and other services.
  4. Match work that has been cut to adjacent work.
  5. Repair areas adjacent to cuts to required condition.
  6. Repair new work damaged by subsequent work.
  7. Remove samples of installed work for testing when requested.
  8. Remove and replace defective and non-complying work.
- D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- E. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- G. Restore work with new products in accordance with requirements of Contract Documents.
- H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material, to full thickness of the penetrated element.
- J. Patching:

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

### **3.08 PROGRESS CLEANING**

- A. During construction, each contractor and subcontractor shall be responsible for daily cleanup and removal of boxes, excess materials, and other debris generated by their work that can be clearly attributed to them. Debris shall be removed from the site by each contractor or placed in the designated trash receptacle(s) noted below. The construction site shall be maintained in a clean and orderly condition at all times.
  1. Each trade shall include in its bid 4 man-hours per week for site cleanup. Provide additional manpower as necessary to stay on project schedule and complete contracted clean up.
  2. Mandatory clean up every Thursday from 2-4 pm.
  3. Contractors who do not clean up their own materials will be backcharged by the General Work and Labor Contractor (Bid Package 6A ) at a rate of \$100.00 per hour.
- B. The General Work and Labor Contractor (Bid Package 6A ) shall be responsible for thorough cleanup of the jobsite, both inside and outside the building, once weekly. This cleanup is intended to remove miscellaneous construction debris such as dirt, dust, small material scraps, wire, screws, nails, empty containers, pallets, and other items that cannot be reasonably assigned to a specific contractor or subcontractor. Cleanup shall include sweeping floors, collecting debris from work areas, organizing materials in a neat manner, and removing debris from the site.
- C. The Construction Manager shall provide 1 large trash receptacle (minimum 15-yard capacity) at the site for use by all contractors throughout the construction period. The Construction Manager shall remove and dispose of the trash each time the receptacle is full (except as otherwise noted below). The location of the receptacle shall be as directed by the Construction Manager.
  1. Demolition debris must be sorted by respective trade in proper trash containers provided by the Construction Manager. Contractors will be back-charged accordingly, if waste materials are not stored / disposed off properly.
  2. Contractors performing exterior enclosure or structural work (e.g., footings, foundations, concrete, masonry, steel, and roofing) shall be responsible for removing their own debris from the site.
- D. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- E. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- F. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- G. Collect and remove waste materials, debris, and trash/rubbish from site (as indicated above) and dispose off-site; do not burn or bury.

### **3.09 PROTECTION OF INSTALLED WORK**

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Protect work from spilled liquids. If work is exposed to spilled liquids, immediately remove protective coverings, dry out work, and replace protective coverings.
- G. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- H. Prohibit traffic from landscaped areas.
- I. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

### **3.10 SYSTEM STARTUP**

- A. Coordinate with requirements of Section 01 9113 - General Commissioning Requirements.
- B. Coordinate schedule for start-up of various equipment and systems.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- G. Submit a written report that equipment or system has been properly installed and is functioning correctly.

### **3.11 DEMONSTRATION AND INSTRUCTION**

- A. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.
- B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- C. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner's personnel.
- D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

### **3.12 ADJUSTING**

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.
- B. Testing, adjusting, and balancing HVAC systems: See Division 23.

### **3.13 FINAL CLEANING**

- A. Each contractor and subcontractor shall remove all debris generated by their work and clean any soiling that affects the work of others. The Construction Manager will coordinate the final clean-up, unless otherwise noted.
- B. Use experienced personnel or professional cleaners to perform final cleaning. Restore all surfaces and equipment to a condition consistent with standard commercial building cleaning and maintenance requirements. Follow all manufacturer's cleaning instructions.
- C. Use cleaning materials that are nonhazardous.

- D. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- E. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition. Leave concrete floors broom clean.
- F. Resilient floors and tile floors shall have their protection removed and floor wet-mopped. All maintenance type sealers shall be applied by Owner, once the Operation and Maintenance manuals have been submitted, and/or the training of their staff completed.
- G. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- H. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned. Remove excess lubrication and other substances. Clean light fixtures and lamps.
- I. Clean filters of operating equipment.
- J. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.
- K. Clean site; sweep paved areas, rake clean landscaped surfaces.
- L. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

### **3.14 CLOSEOUT PROCEDURES**

- A. Make submittals that are required by governing or other authorities.
- B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.
- C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.
- D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.
- E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.
- F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
- G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.
- H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

### **3.15 MAINTENANCE**

- A. Provide service and maintenance of components indicated in specification sections.
- B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
- C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

- D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

**END OF SECTION**

**SECTION 01 7800  
CLOSEOUT SUBMITTALS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Project record documents.
- B. Operation and maintenance data.
- C. Warranties and bonds.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 7200 - General Conditions and 00 7300 - Supplementary Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
- B. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- C. Section 01 7000 - Execution and Closeout Requirements: Contract closeout procedures.
- D. Individual Product Sections: Specific requirements for operation and maintenance data.
- E. Individual Product Sections: Warranties required for specific products or Work.

**1.03 SUBMITTALS**

- A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
- B. Operation and Maintenance Data:
  - 1. Submit an electronic (PDF) format document of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return with comments.
  - 2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed electronic documents within ten days after acceptance.
  - 3. Submit an electronic (PDF) format of completed documents 15 days prior to final inspection. This document will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
  - 4. Submit two sets of revised final documents in final form within 10 days after final inspection.
    - a. Include an electronic (PDF) format in addition to the hard copies.
- C. Warranties and Bonds:
  - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
  - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
  - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 PROJECT RECORD DOCUMENTS**

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
  - 1. Drawings.
  - 2. Specifications.
  - 3. Addenda.

4. Change Orders and other modifications to the Contract.
  5. Reviewed shop drawings, product data, and samples.
  6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
  - C. Store record documents separate from documents used for construction.
  - D. Record information concurrent with construction progress.
  - E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
    1. Manufacturer's name and product model and number.
    2. Product substitutions or alternates utilized.
    3. Changes made by Addenda and modifications.
  - F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
    1. Measured depths of foundations in relation to finish first floor datum.
    2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
    3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
    4. Field changes of dimension and detail.
    5. Details not on original Contract drawings.

### **3.02 OPERATION AND MAINTENANCE DATA**

- A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

### **3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES**

- A. For Each Product, Applied Material, and Finish:
  1. Product data, with catalog number, size, composition, and color and texture designations.
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional information as specified in individual product specification sections.
- E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

### **3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS**

- A. For Each Item of Equipment and Each System:
  1. Description of unit or system, and component parts.
  2. Identify function, normal operating characteristics, and limiting conditions.
  3. Include performance curves, with engineering data and tests.

4. Complete nomenclature and model number of replaceable parts.
- B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- D. Include color coded wiring diagrams as installed.
- E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
  1. Include HVAC outdoor and exhaust air damper calibration strategy.
    - a. Include provisions which ensure that full closure of dampers can be achieved.
  2. Include Carbon Dioxide Monitoring Protocol.
  3. Include Carbon Monoxide Monitoring Protocol.
  4. Include Frost Mitigation Strategy for ventilation heat-recovery system.
- G. Provide servicing and lubrication schedule, and list of lubricants required.
- H. Include manufacturer's printed operation and maintenance instructions.
- I. Include sequence of operation by controls manufacturer.
- J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- K. Provide control diagrams by controls manufacturer as installed.
- L. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- M. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- N. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- O. Include test and balancing reports.
- P. Additional Requirements: As specified in individual product specification sections.

### **3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS**

- A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
- B. Where systems involve more than one specification section, provide separate tabbed divider for each system.
- C. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
- D. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- E. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- F. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

- G. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
- H. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
  - 1. Electronic Document: Provide "bookmarks" for each separate product and system; identify the contents of the "bookmarked" section with "sub-bookmarks" describing the product and major component parts of equipment.
- I. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.
- J. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- K. Arrangement of Contents: Organize each volume in parts as follows:
  - 1. Project Directory.
  - 2. Table of Contents, of all volumes, and of this volume.
  - 3. Operation and Maintenance Data: Arranged by system, then by product category.
    - a. Source data.
    - b. Product data, shop drawings, and other submittals.
    - c. Operation and maintenance data.
    - d. Field quality control data.
    - e. Photocopies of warranties and bonds.
  - 4. Design Data: To allow for addition of design data furnished by Architect or others, provide a tab labeled "Design Data" and provide a binder large enough to allow for insertion of at least 20 pages of typed text.

### **3.06 WARRANTIES AND BONDS**

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.
- E. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.
- F. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
- G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
- H. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

**END OF SECTION**

**SECTION 02 4100  
DEMOLITION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Selective demolition of building elements for alteration purposes. excluding removal of hazardous materials and toxic substances
- B. Abandonment and removal of existing utilities and utility structures.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
- B. Section 01 6000 - Product Requirements: Handling and storage of items removed for salvage and relocation.
- C. Section 01 7000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

**1.03 DEFINITIONS**

- A. Demolish: Dismantle, raze, destroy, or wreck any building or structure or any part thereof.
- B. Remove: Detach or dismantle items from existing construction and dispose of them off site, unless items are indicated to be salvaged or reinstalled.
- C. Remove and Salvage: Detach or dismantle items from existing construction in a manner to prevent damage. Clean, package, label and deliver salvaged items to Owner in ready-for-reuse condition.
- D. Remove and Reinstall: Detach or dismantle items from existing construction in a manner to prevent damage. Clean and prepare for reuse and reinstall where indicated.
- E. Existing to Remain: Designation for existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

**1.04 REFERENCE STANDARDS**

- A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

**1.06 QUALITY ASSURANCE**

- A. Demolition Firm Qualifications: Company specializing in the type of work required.
  - 1. Minimum of 5 years of documented experience.

**PART 2 PRODUCTS -- NOT USED**

**PART 3 EXECUTION**

**3.01 DEMOLITION**

- A. See demolition drawings.
- B. Remove items indicated, for salvage, relocation, and recycling.
- C. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as required so that required rough grade elevations do not subside within one year after completion.

### **3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS**

- A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
  - 1. Obtain required permits.
  - 2. Comply with applicable requirements of NFPA 241.
  - 3. Use of explosives is not permitted.
  - 4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
  - 5. Provide, erect, and maintain temporary barriers and security devices.
  - 6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
  - 7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
  - 8. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
  - 9. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
  - 10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.
- B. Do not begin removal until receipt of notification to proceed from Owner.
- C. Do not begin removal until built elements to be salvaged or relocated have been removed.
- D. Protect existing structures and other elements to remain in place and not removed.
  - 1. Provide bracing and shoring.
  - 2. Prevent movement or settlement of adjacent structures.
  - 3. Stop work immediately if adjacent structures appear to be in danger.
- E. Minimize production of dust due to demolition operations. Do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- F. Hazardous Materials:
  - 1. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCBs, and mercury.
- G. Perform demolition in a manner that maximizes salvage and recycling of materials.
  - 1. Dismantle existing construction and separate materials.
  - 2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

### **3.03 EXISTING UTILITIES**

- A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
- H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone. Identify and mark, in same manner as other utilities to remain, utilities to be reconnected.

### **3.04 SELECTIVE DEMOLITION FOR ALTERATIONS**

- A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.
  - 1. Verify construction and utility arrangements are as indicated.
  - 2. Report discrepancies to Architect before disturbing existing installation.
  - 3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
- B. Separate areas in which demolition is being conducted from areas that remain occupied.
  - 1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 5000 in locations indicated on drawings.
- C. Maintain weatherproof exterior building enclosure, except for interruptions required for replacement or modifications; prevent water and humidity damage.
- D. Maintain existing rated assemblies and exit requirements.
- E. Remove existing work as indicated and required to accomplish new work.
  - 1. Remove items indicated on drawings.
- F. Services including, but not limited to, HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications: Remove existing systems and equipment as indicated.
  - 1. Maintain existing active systems to remain in operation, and maintain access to equipment and operational components.
  - 2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
  - 3. Verify that abandoned services serve only abandoned facilities before removal.
  - 4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.
- G. Protect existing work to remain.
  - 1. Prevent movement of structure. Provide shoring and bracing as required.
  - 2. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
  - 3. Repair adjacent construction and finishes damaged during removal work.
  - 4. Patch to match new work.

### **3.05 DEBRIS AND WASTE REMOVAL**

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.
- C. Clean up spillage and wind-blown debris from public and private lands.

**END OF SECTION**

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**SECTION 02 4113  
SITE SELECTIVE DEMOLITION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Selective demolition of built site elements.

**1.02 SUBMITTALS**

- A. Project Record Documents: Accurately record actual locations of capped and active utilities discovered during construction.

**PART 2 PRODUCTS -- NOT USED**

**PART 3 EXECUTION**

**3.01 PREPARATION**

- A. Protect existing utilities from damage.
  - 1. The contractor shall contact Gopher State One Call at 800-252-1166 prior to beginning any excavation work.
    - a. Also contact the Owner's Representative for private site utility locations.
  - 2. The contractor shall notify the various utility companies if work will expose, affect, or endanger any existing utility.
  - 3. The contractor shall support, protect or relocate existing utilities affected by the work.
    - a. Means and methods shall be approved by the utility owner.

**3.02 SCOPE**

- A. Remove all items shown on the Drawings.
  - 1. All removals shall include removal of associated concrete footings/foundations.

**3.03 GENERAL PROCEDURES AND PROJECT CONDITIONS**

- A. Do not begin removal until receipt of notification to proceed from Owner.
- B. Protect existing structures and other elements that are not to be removed.
  - 1. Provide bracing and shoring.
  - 2. Prevent movement or settlement of adjacent structures and/or equipment.
  - 3. Stop work immediately if adjacent structures and/or equipment appear to be in danger.
- C. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- D. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.
  - 1. Sawcut edge of existing pavement, including ends of curb & gutter, in areas of partial pavement removal and where new pavement will abut against existing pavements.
    - a. Sawcut concrete pavements to a minimum depth of 1/3 of the pavement thickness.
      - 1) Concrete pavements shall be sawcut at the nearest joint to the removal limit.
    - b. Sawcut asphalt pavements full depth.
      - 1) 'Knifing' through the pavement is not accepted.
- E. Backfill depressions with material in accordance with 31 2324.

**3.04 EXISTING UTILITIES**

- A. Coordinate work with Owner.
  - 1. Notify Owner before starting work.
- B. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- C. Protect existing utilities to remain from damage.
- D. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without prior notification to Owner.

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

**3.05 DEBRIS AND WASTE REMOVAL**

- A. Remove all demolition materials, debris, rubbish, non-reusable soil, etc., from the site.
  - 1. All the above shall become property of the Contractor.
  - 2. Do not bury the materials on-site.
- B. Leave site in clean condition, ready for subsequent work.

**END OF SECTION**

**SECTION 03 2000  
CONCRETE REINFORCING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Reinforcing steel for cast-in-place concrete.
- B. Supports and accessories for steel reinforcement.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete.

**1.03 REFERENCE STANDARDS**

- A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).
- B. ACI MNL-66 - ACI Detailing Manual; 2020.
- C. ACI SPEC-117 - Specification for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).
- D. ACI SPEC-301 - Specifications for Concrete Construction; 2020.
- E. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2025.
- F. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2024.
- G. ASTM C1116/C1116M - Standard Specification for Fiber-Reinforced Concrete; 2023.
- H. AWS D1.4/D1.4M - Structural Welding Code - Steel Reinforcing Bars; 2018, with Amendment (2020).

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Comply with requirements of ACI MNL-66 Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.
  - 1. Prepare shop drawings under seal of a Professional Structural Engineer experienced in design of work of this type and licensed in the State in which the Project is located.
- C. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.

**1.05 QUALITY ASSURANCE**

- A. Perform work of this section in accordance with ACI SPEC-301.
- B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.4/D1.4M and no more than 12 months before start of scheduled welding work.

**1.06 JOB SITE STORAGE**

- A. Store reinforcing steel at the site on timbers or planks, not on concrete, to keep steel free from mud, water, and deleterious materials. When stored during winter months, cover reinforcing steel and provide ventilation to prevent condensation and corrosion.

**PART 2 PRODUCTS**

**2.01 REINFORCEMENT**

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
  - 1. Deformed billet-steel bars.
- B. Steel Welded Wire Reinforcement (WWR): Plain type; ASTM A1064/A1064M.
  - 1. WWR Style: As indicated on drawings.

- C. Reinforcement Accessories:
  - 1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch.
  - 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
  - 3. Provide plastic components for placement within 1-1/2 inches of weathering surfaces.
  - 4. Fiber Reinforcement ASTM C1116/C1116M Type III Engineered Polypropylene Fibers.

## **2.02 FABRICATION**

- A. Fabricate concrete reinforcing in accordance with ACI CODE-318 and ACI 315.
- B. Number Type and Spacing of Supports and Other Accessories: Conform to ACI 315.
- C. Support and tie all reinforcing steel.
- D. Shop fabricate reinforcing steel to size, shape, and dimensions.
- E. Defects not permitted:
  - 1. Bar lengths, depths, and bends exceeding specified fabrication tolerances.
  - 2. Bends or kinks not indicated on the Drawings or final Shop Drawings.
  - 3. Bars with reduced cross-section due to excessive rusting or other cause.
- F. Fabrication tolerances per ACI SPEC-117.

## **PART 3 EXECUTION**

### **3.01 PLACEMENT**

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position.
- B. Support all reinforcing steel on raised pins, chairs, or approved bar supports. Reinforcing shall not be placed directly on the subgrade or formwork at the bottom of slabs-on-grade or toppings. Hand lifting of reinforcing during concrete placement is not permitted. Provide bar supports and spacers as required to ensure accurate positioning and secure placement of reinforcing steel. Bar supports and spacers shall comply with the referenced standards.
- C. All bars shall be bent cold to the dimensions required before placing. Bends for ties shall be made around a pin having a diameter of not less than two times the thickness of the bar. Bends of all other bars shall be made around a pin having a diameter of not less than six times the minimum thickness of the bars.
  - 1. Do not bend bars after partially embedded in hardened concrete, except as shown on Drawings.
- D. All bars shall be tagged and marked as to locations to facilitate placing of steel in the field. All job site reinforcing steel shall be stored clear of the ground and protected from damage and rusting.
- E. Do not displace or damage vapor barrier.
- F. Accommodate placement of formed openings.
- G. Maintain concrete cover around reinforcing as follows unless noted otherwise on Drawings:
  - 1. Concrete against earth, without use of forms: 3 inch for bars; 2 inch for mesh.
  - 2. Concrete against earth, but placed in forms: 2 inch.
  - 3. Concrete exposed to weather: 2 inch.
  - 4. Columns or beams not exposed to weather: 1-1/2 inch.
  - 5. Walls not exposed to ground or weather: 1 inch.
- H. Comply with applicable code for concrete cover over reinforcement.
- I. Bond and ground all reinforcement to requirements of Division 26.
- J. Notify the Architect at least 24 hours prior to placing concrete in any portion of the structure. Placement of concrete in any portion of the structure prior to completion of reinforcing steel installation for the entire section is prohibited.

- K. Where delays occur in the placement of concrete, all reinforcing steel shall be inspected and cleaned of partially set concrete, laitance, and other foreign matter, and shall be dry before concrete placement resumes.
- L. Place temperature reinforcement for slabs-on-grade at the mid-depth of the slab.
- M. Splice reinforcing bars only where indicated on Drawings.
- N. Do not extend reinforcing steel through expansion or contraction joints. Provide doweled joints at expansion and contraction joints, with dowels detailed and installed to permit free longitudinal movement at one end.
- O. Installation tolerances per ACI SPEC-117.

### **3.02 FIELD QUALITY CONTROL**

- A. An independent testing agency, as specified in Section 01 4000 - Quality Requirements, will inspect installed reinforcement for compliance with contract documents before concrete placement.

**END OF SECTION**

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**SECTION 03 3000  
CAST-IN-PLACE CONCRETE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Concrete formwork.
- B. Floors and slabs on grade.
- C. Joint devices associated with concrete work.
- D. Miscellaneous concrete elements, including, but not limited to: equipment pads and other items indicated on Drawings.
- E. Concrete curing.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 2000 - Concrete Reinforcing.
- B. Section 03 3512 - Concrete Surface Treatment: Concrete curing and sealing.
- C. Section 07 9200 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.

**1.03 REFERENCE STANDARDS**

- A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).
- B. ACI PRC-211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide; 2022.
- C. ACI PRC-302.1 - Guide to Concrete Floor and Slab Construction; 2015.
- D. ACI PRC-304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).
- E. ACI PRC-305 - Guide to Hot Weather Concreting; 2020.
- F. ACI PRC-306 - Guide to Cold Weather Concreting; 2016.
- G. ACI PRC-308 - Guide to External Curing of Concrete; 2016.
- H. ACI PRC-347 - Guide to Formwork for Concrete; 2014 (Reapproved 2021).
- I. ACI SPEC-117 - Specification for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).
- J. ACI SPEC-301 - Specifications for Concrete Construction; 2020.
- K. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2024a.
- L. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2024.
- M. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2025.
- N. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens); 2024.
- O. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.
- P. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.
- Q. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2024.
- R. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2025a.
- S. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2024.

- T. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2020.
- U. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2022.
- V. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2024.
- W. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).

#### **1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
  - 1. Provide product data for the following: admixtures, vapor retarders, grout, bonding and jointing products, and curing and sealing compounds.
  - 2. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.
- C. Mix Design: Submit proposed concrete mix design.
  - 1. Engage an independent testing laboratory to test proposed aggregates and to prepare concrete mix designs for each class of concrete required.
  - 2. Submit aggregate test reports and concrete mix designs for review and approval at least 14 days prior to placing concrete.
  - 3. Test each type of fine and coarse aggregate for compliance with ASTM C33/C33M.
  - 4. Indicate proposed mix design complies with requirements of ACI SPEC-301, Section 4 - Concrete Mixtures.
  - 5. Indicate proposed mix design complies with requirements of ACI CODE-318, Chapter 5 - Concrete Quality, Mixing and Placing.
- D. Shop Drawings:
  - 1. Construction Joint Layout: Submit drawings indicating proposed construction joints required to construct the structure.
    - a. Locations of construction joints are subject to review and approval by the Architect.
- E. Test Reports: Submit report for each test or series of tests specified.
- F. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.
- G. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

#### **1.05 QUALITY ASSURANCE**

- A. Perform work of this section in accordance with ACI SPEC-301 and ACI CODE-318.
  - 1. Maintain one copy of each document on site.
- B. Follow recommendations of ACI PRC-305 when concreting during hot weather.
- C. Follow recommendations of ACI PRC-306 when concreting during cold weather.
- D. Concrete Testing Service: Engage a testing agency acceptable to the Architect to perform material evaluation test and to design concrete mixes.
- E. Testing and Retesting: Materials and installed Work may be tested and retested at any time during the progress of the Work. Tests, including retesting of rejected materials or installed Work, shall be performed at the Contractor's expense.
- F. Installer Qualifications: Perform the Work using an adequate number of skilled and properly trained workers who are experienced in the required trades and thoroughly familiar with the

specified requirements and the methods necessary for proper execution of the Work of this Section.

- G. Manufacturer Qualifications: Products used in the Work of this Section shall be manufactured by firms regularly engaged in the production of similar products and with a documented history of successful performance acceptable to the Architect.
- H. Product Options: Comply with Section 01 6000 - Product Requirements.
- I. Listing and Labeling: Submit material certificates in lieu of laboratory test reports when permitted by the Architect. Material certificates shall be signed by both the manufacturer and the Contractor, certifying that each material complies with or exceeds specified requirements. Provide certifications from admixture manufacturers verifying that chloride content complies with the specification requirements.

## **PART 2 PRODUCTS**

### **2.01 FORMWORK**

- A. Formwork Design and Construction: Comply with guidelines of ACI PRC-347 to provide formwork that will produce concrete complying with tolerances of ACI SPEC-117.
- B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
  - 1. Form Facing for **Exposed Finish Concrete**: Contractor's choice of materials that will provide smooth, stain-free final appearance.
    - a. Provide formwork materials, workmanship, and construction methods capable of producing exposed concrete surfaces that are plumb, level, true to line, and uniform in appearance. Forms shall be clean, mortar-tight, adequately stiffened, and properly aligned to prevent leakage, deflection, or surface irregularities. Use new or like-new form-facing materials for exposed concrete and maintain consistent form materials, panel sizes, joint patterns, and release agents within each exposed area. Remove formwork in a manner that prevents damage, discoloration, or surface defects in exposed concrete.
  - 2. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
  - 3. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

### **2.02 REINFORCEMENT MATERIALS**

- A. Comply with requirements of Section 03 2000.

### **2.03 CONCRETE MATERIALS**

- A. Cement: ASTM C150/C150M, Type I - Normal Portland type - for all general purpose concrete applications.
- B. Cement: ASTM C150/C150M, Type IA - Air Entraining Portland type - for all general purpose concrete applications where air entrainment is required.
- C. Cement: ASTM C150/C150M, Type II - Moderate Portland type - for all concrete applications exposed to earth/groundwater.
- D. Cement: ASTM C150/C150M, Type IIIA - Air Entraining Portland type - for all exterior concrete applications not exposed to earth/groundwater.
- E. Fine and Coarse Aggregates: ASTM C33/C33M.
  - 1. Acquire aggregates for entire project from same source.
  - 2. Shale or deleterious content shall be no more than 0.5% for slabs and 1% for all other concrete.
  - 3. Proportioning of ingredients shall be by ACI SPEC-301 Method 1 or 2.
- F. Fly Ash: ASTM C618, Class C or F.
- G. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

## **2.04 ADMIXTURES**

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- B. Air Entrainment Admixture: ASTM C260/C260M. Exterior use only.

## **2.05 ACCESSORY MATERIALS**

- A. Underslab Vapor Retarder:
  - 1. Sheet Material: ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. Single-ply polyethylene is prohibited.
  - 2. Thickness: 15 mils min.
  - 3. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
  - 4. Products:
    - a. ISI Building Products; Viper VaporCheck II 15-mil (Class A): [www.isibp.com/#sle](http://www.isibp.com/#sle).
    - b. Viaflex, Inc; Vaporblock VB15: [www.viaflex.com](http://www.viaflex.com).
    - c. W. R. Meadows, Inc; PERMINATOR Class A - 15 mils (0.38 mm): [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
    - d. Substitutions: See Section 01 6000 - Product Requirements.
- B. Non-Shrink Cementitious Grout: Premixed compound consisting of nonmetallic aggregate, cement, water reducing and plasticizing agents.
  - 1. Grout: Comply with ASTM C1107/C1107M.
  - 2. Minimum Compressive Strength at 48 Hours, ASTM C109/C109M: 2,000 pounds per square inch.
  - 3. Minimum Compressive Strength at 28 Days, ASTM C109/C109M: 7,000 pounds per square inch.

## **2.06 BONDING AND JOINTING PRODUCTS**

- A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.
  - 1. Products:
    - a. Euclid Chemical Company; AKKRO-7T: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - b. Laticrete International, Inc; L&M Everbond: [www.laticrete.com](http://www.laticrete.com).
    - c. SpecChem, LLC; Strong Bond Acrylic Bonder: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
    - d. W. R. Meadows, Inc; ACRY-LOK: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
    - e. Substitutions: See Section 01 6000 - Product Requirements.
- B. Slab Isolation Joint Filler: 1/2-inch thick, height equal to slab thickness, with removable top section forming 1/2-inch deep sealant pocket after removal.
- C. Dowel Sleeves: Plastic sleeve and nailable plastic base for smooth, round, steel load-transfer dowels.

## **2.07 CURING MATERIALS**

- A. Curing and Sealing Compound: See Section 03 3512 - Concrete Surface Treatment.
- B. Water: Potable, not detrimental to concrete.

## **2.08 CONCRETE MIX DESIGN**

- A. Proportioning Normal Weight Concrete: Comply with ACI PRC-211.1 recommendations.
- B. Admixtures: Add acceptable admixtures as recommended in ACI PRC-211.1 and at rates recommended or required by manufacturer.
- C. Normal Weight Concrete:
  - 1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: As indicated on drawings.

2. Fly Ash Content: Maximum 25 percent of cementitious materials by weight.

## **2.09 MIXING**

- A. No site mixed concrete will be permitted.
- B. Transit Mixers: Comply with ASTM C94/C94M.
- C. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

### **3.02 PREPARATION**

- A. Formwork: Comply with requirements of ACI SPEC-301. Design and fabricate forms to support all applied loads until concrete is cured and for easy removal without damage to concrete.
- B. Verify that forms are clean and free of rust before applying release agent.
- C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- D. Fillets shall be used at all exposed-to-view corners.
- E. No wood braces or spreaders shall be buried in concrete.
- F. The contractor shall assume full liability for all damage due to the removal of forms.
- G. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in accordance with bonding agent manufacturer's instructions.
  1. Use latex bonding agent only for non-load-bearing applications.
- H. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Comply with ASTM E1643. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.
  1. Vapor Retarder Over Granular Fill: Install compactible granular fill before placing vapor retarder as indicated on drawings. Do not use sand.

### **3.03 PLACING CONCRETE**

- A. Place concrete in accordance with ACI PRC-304.
- B. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- C. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.

### **3.04 SLAB JOINTING**

- A. Locate joints as indicated on drawings.
- B. Anchor joint fillers and devices to prevent movement during concrete placement.
- C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
  1. Install wherever necessary to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.
- D. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab.

- E. Construction Joints: Where not otherwise indicated, use metal combination screed and key form, with removable top section for joint sealant.

### **3.05 FLOOR FLATNESS AND LEVELNESS TOLERANCES**

- A. Maximum Variation of Surface Flatness:
  - 1. Exposed Concrete Floors: 1/4 inch in 10 feet.
  - 2. Under Seamless Resilient Flooring: 1/4 inch in 10 feet.
  - 3. Under Carpeting: 1/4 inch in 10 feet.
- B. Correct the slab surface if tolerances are less than specified.
- C. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

### **3.06 CONCRETE FINISHING**

- A. Repair surface defects, including tie holes, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Patch tie holes and defects.
- D. Concrete Slabs: Finish to requirements of ACI PRC-302.1 and as follows:
  - 1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI PRC-302.1; thick floor coverings include quarry tile, ceramic tile, and Portland cement terrazzo with full bed setting system.
  - 2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI PRC-302.1; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
  - 3. Decorative Exposed Surfaces: Trowel as described in ACI PRC-302.1; take measures necessary to avoid black-burnish marks; decorative exposed surfaces include surfaces to be stained or dyed, pigmented concrete, surfaces to receive liquid hardeners, surfaces to receive dry-shake hardeners, surfaces to be polished, and all other exposed slab surfaces.

### **3.07 CURING AND PROTECTION**

- A. Comply with requirements of ACI PRC-308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

### **3.08 BOARD INSTALLATION AT FOUNDATION PERIMETER**

- A. Apply adhesive to back of boards:
- B. Install boards horizontally on foundation perimeter.
  - 1. Place boards to maximize adhesive contact.
  - 2. Install in running bond pattern.
  - 3. Butt edges and ends tightly to adjacent boards and to protrusions.
- C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

### **3.09 FIELD QUALITY CONTROL**

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

- D. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 50 cubic yards or less of each class of concrete placed.
- E. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
- F. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

### **3.10 DEFECTIVE CONCRETE**

- A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
- B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.
- C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

### **3.11 PROTECTION**

- A. Do not permit traffic over unprotected concrete floor surface until fully cured.

**END OF SECTION**

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**SECTION 03 3512  
CONCRETE SURFACE TREATMENT**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Curing and Sealing Materials.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete. Finishing of concrete surface to tolerance; floating, troweling, and similar operations; curing.

**1.03 REFERENCE STANDARDS**

- A. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete; 2025.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate the work with concrete floor placement and concrete floor curing.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's published data on each finishing product, including information on compatibility of different products and limitations.
- C. Maintenance Data: Provide data on maintenance and renewal of applied finishes.
- D. Warranty Documentation: Manufacturer warranty; ensure that forms have been completed in Owner's name and registered with the manufacturer.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials in manufacturer's sealed packaging, including application instructions.

**1.07 FIELD CONDITIONS**

- A. Maintain light level equivalent to a minimum 200 W light source at 8 feet above the floor surface over each 20 foot square area of floor being finished.
- B. Maintain ambient temperature of 50 degrees F minimum.

**1.08 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Correct defective work within a two-year period commencing on the Date of Substantial Completion.

**PART 2 PRODUCTS**

**2.01 MATERIALS**

- A. Curing and Sealing Compound, Low Gloss: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C1315 Type 1 Class A.
  - 1. Products:
    - a. BASF; Kure 1315.
    - b. Euclid Chemical Company; Eucocure.
    - c. LM Scofield; Cureseal WB.
    - d. L&M Construction Chemicals, Inc.; Dress & Seal WB.
    - e. SpecChem, LLC; Cure & Seal WB 30.
    - f. Substitutions: See Section 01 6000 - Product Requirements.
- B. Application
  - 1. Install per manufacturer's instructions when pouring all cast-in-place concrete.

2. Sealed Concrete Floor Finish: Where Finish Plans note that sealed concrete is the floor finish, an additional coat is to be applied with a roller or a micro fiber applicator just prior to the Date of Substantial Completion.
  - a. Prior to installation, floors need to be thoroughly scraped, cleaned, and dried. All construction joints, saw cut joints, etc. need to be filled with floor filler.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that floor surfaces are acceptable to receive the work of this section.
- B. Verify that flaws in concrete have been patched and joints filled with methods and materials suitable for further finishes.

#### **3.02 GENERAL**

- A. Apply materials in accordance with manufacturer's instructions.

#### **3.03 COATING APPLICATION**

- A. Verify that surface is free of previous coatings, sealers, curing compounds, water repellents, laitance, efflorescence, fats, oils, grease, wax, soluble salts, residues from cleaning agents, and other impediments to adhesion.
- B. Protect adjacent non-coated areas from drips, overflow, and overspray; immediately remove excess material.

#### **3.04 PROTECTION**

- A. Do not permit traffic over unprotected floor surface.

**END OF SECTION**

**SECTION 06 1000  
ROUGH CARPENTRY**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Rough opening framing for doors, windows, and roof openings.
- B. Preservative treated wood materials, where applicable.
- C. Fire retardant treated wood materials, where applicable.
- D. Concealed wood blocking, nailers, and supports.

**1.02 REFERENCE STANDARDS**

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- B. PS 1 - Structural Plywood; 2023.
- C. PS 20 - American Softwood Lumber Standard; 2025.
- D. SPIB (GR) - Standard Grading Rules; 2021.

**1.03 QUALITY ASSURANCE**

- A. Listing and Labeling:
  - 1. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
- B. Manufacturer's Qualifications: Products used in the work of this Sections shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful productions acceptable to the Architect.
- C. Installer's Qualifications: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.
- D. Source Limitations:
  - 1. Single-Source Responsibility for Engineered Wood Products: Obtain each type of engineered wood product from one source and by a single manufacturer
  - 2. Single-Source Responsibility for Fire-Retardant-Treated Wood: Obtain each type of fire-retardant-treated wood product from one source and by a single producer.

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
- B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

**PART 2 PRODUCTS**

**2.01 GENERAL REQUIREMENTS**

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
  - 1. Species: Spruce-Pine-Fir (South), unless otherwise indicated.
  - 2. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
  - 3. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at [www.alsc.org](http://www.alsc.org), and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

4. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

## **2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS**

- A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).
- B. Sizes: Nominal sizes as indicated on drawings, S4S.
- C. Moisture Content: Kiln-dry or MC15.
- D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
  1. Lumber: S4S, No. 2 or Standard Grade.
  2. Boards: Standard or No. 3.

## **2.03 CONSTRUCTION PANELS**

- A. Other Applications:
  1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
  2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
  3. Other Locations: PS 1, C-D Plugged or better.

## **2.04 ACCESSORIES**

- A. Metal and Finish of Fasteners:
  1. Fire-Retardant-Treated Wood:
    - a. Nails, timber rivets, wood screws, and lag screws: Hot-dip galvanized steel complying with ASTM A153/A153M Class D.
  2. Preservative-Treated Wood:
    - a. Nails, timber rivets, wood screws, and lag screws - general use: Hot-dip galvanized steel complying with ASTM A153/A153M Class D.
  3. Untreated Wood: Unfinished steel.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION - GENERAL**

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
- C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

### **3.02 BLOCKING, NAILERS, AND SUPPORTS**

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to authorities having jurisdiction may be used in lieu of solid wood blocking.
- C. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.
- D. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
- E. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- F. Provide nonstructural framing and blocking to support the following:
  1. Cabinets and shelf supports.

2. Wall brackets.
3. Handrails.
4. Grab bars.
5. Towel and bath accessories.
6. Wall-mounted door stops.
7. Chalkboards and marker boards.
8. Wall paneling and trim.
9. Joints of rigid wall coverings that occur between studs.
10. Other wall- or ceiling-mounted items indicated on drawings.

### **3.03 INSTALLATION OF CONSTRUCTION PANELS**

- A. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
  1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
  2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
  3. Install adjacent boards without gaps.
  4. Size and Location: As indicated on drawings.

### **3.04 CLEANING**

- A. Waste Disposal: See Section 01 7000 - Execution and Closeout Requirements.
  1. Comply with applicable regulations.
  2. Do not burn scrap on project site.
  3. Do not burn scraps that have been pressure treated.
  4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.
- B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.
- C. Prevent sawdust and wood shavings from entering the storm drainage system.

**END OF SECTION**

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**SECTION 06 4100  
MILLWORK**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Specially fabricated cabinet units.
- B. Hardware.
- C. Preparation for installing utilities.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking and installation of millwork.
- B. Section 12 3600 - Countertops.

**1.03 REFERENCE STANDARDS**

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- C. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
  - 1. Show location of each item, dimensioned plans and elevations, large scale details, attachment devices, and other components.
- C. Product Data: Provide data for hardware accessories.
- D. Samples: Submit one sample of finish material illustrating style, color, and finish.

**1.05 QUALITY ASSURANCE**

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
- B. Installer Qualifications: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the methods needed for proper performance of the work of this section.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Protect units from moisture damage.
- B. Do not deliver woodwork until painting and similar operations that could damage soil, or deteriorate woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas whose environmental conditions meet requirements specified.
- C. Protect woodwork during transit, delivery, storage, and handling to prevent damage, soiling, and deterioration.

**1.07 FIELD CONDITIONS**

- A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

**PART 2 PRODUCTS**

**2.01 CABINETS**

- A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI//AWMAC/WI (AWS) for Custom Grade.

- B. Cabinets:
  - 1. Finish - Exposed Exterior Surfaces: Decorative laminate.
  - 2. Finish - Exposed Interior Surfaces: Decorative laminate.
  - 3. Finish - Concealed Surfaces: Melamine.
  - 4. Edge Profiles: Plastic edge banding; thickness as indicated under Accessories.
  - 5. Casework Construction Type: Type A - Frameless.
  - 6. Interface Style for Cabinet and Door: Style 1 - Overlay; flush overlay.
  - 7. Grained Face Layout for Cabinet and Door Fronts: Flush panel.
    - a. Custom Grade: Doors, drawer fronts and false fronts wood grain to run and match vertically within each cabinet unit.
  - 8. Adjustable Shelf Loading: 50 psf.
  - 9. Toe Base:
    - a. Shall be either separate from or integral to the cabinet body at the manufacturer's option.
      - 1) Separate bases shall be mechanically fastened to the cabinet bottom at the factory.
    - b. Construction:
      - 1) Manufacturer's option.
      - 2) Material thickness shall be at least 3/4 inch.
      - 3) Sleepers shall be provided at a maximum of 36 inches (86.4 mm) on center.
    - c. Height: 4 inches unless otherwise detailed on drawings.

## 2.02 WOOD-BASED COMPONENTS

- A. Wood fabricated from old growth timber is not permitted.
- B. Provide sustainably harvested wood, certified or labeled; see Section 01 6000.

## 2.03 LAMINATE MATERIALS

- A. Manufacturers:
  - 1. Arborite: [www.arborite.com](http://www.arborite.com).
  - 2. Formica Corporation: [www.formica.com](http://www.formica.com).
  - 3. Panolam Industries International, Inc. Nevamar: [www.nevamar.com](http://www.nevamar.com).
  - 4. Wilsonart, LLC: [www.wilsonart.com](http://www.wilsonart.com).
  - 5. Abet Laminati: [www.abetlaminati.com/#sle](http://www.abetlaminati.com/#sle).
  - 6. Substitutions: See Section 01 6000 - Product Requirements.
- B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.
- C. Plastic Laminate to comply with NFPA 286 standards and have a FSI (Flame Spread Index) of less than 25 as tested with ASTM E84.
- D. Plastic Laminate Schedule:
  - 1. Laminate Casework and Paneling (LAM-1): Wilsonart, Limber Maple 10734, or approved equal.
  - 2. Laminate Portal Panels (LAM-3): Abet Laminati, 1850 SEI, or approved equal.

## 2.04 ACCESSORIES

- A. Adhesive: Type recommended by fabricator to suit application.
- B. Plastic Edge Banding: Extruded PVC, convex shaped; smooth finish; of width to match component thickness.
  - 1. Color: As selected by Architect from manufacturer's standard range.
  - 2. Thickness:
    - a. Door & Drawer Edges: 3 mm.
    - b. Concealed Interior Cabinet Box Edges: 1 mm.
    - c. Countertop Edges: 3 mm.

- d. Exposed Shelf Edges: 3 mm.
- e. Exposed Interior Box Edges: 3 mm.
- 3. Product: Woodtape Accent Edge PVC edge banding, Canplast, Charter Industries, or approved equal.
- C. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
- D. Metal Corner Trim (TR-1): Outwater Industries, 90 Degree Outside Corner Channel ALU5116-S-36-4-PKIT, or approved equal.

## 2.05 HARDWARE

- A. Hardware: BHMA A156.9, types as indicated for quality grade specified.
- B. Adjustable Casework Shelf Supports: Standard side-mounted system using multiple holes for pin supports and coordinated shelf rests, standard finish, for nominal 2 inch spacing adjustments.
- C. Countertop Support Brackets: Fixed, L-shaped, face-of-stud mounting.
  - 1. For 24" deep countertops: Model AM 1824 B as manufactured by A & M Hardware.
  - 2. For 30" deep countertops: Model AM 1824 B as manufactured by A & M Hardware.
- D. Drawer and Door Pulls: "U" shaped wire pull, steel with satin finish, 4 inch centers.
- E. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with satin finish.
- F. Drawer Slides:
  - 1. Static Load Capacity: Standard.
  - 2. Features: Provide self closing/stay closed and soft-close type.
  - 3. Regular, kneespace and pencil: 100-pound load rate epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers. Positive stop both directions with self-closing feature. Paper storage, 150-pound load rated epoxy coated steel slides.
  - 4. Manufacturers:
    - a. Grass America Inc: [www.grassusa.com/#sle](http://www.grassusa.com/#sle).
    - b. Knappe & Vogt Manufacturing Company: [www.knappeandvogt.com](http://www.knappeandvogt.com).
    - c. Julius Blum, Inc; [www.blum.com](http://www.blum.com).
    - d. Substitutions: See Section 01 6000 - Product Requirements.
- G. Hinges: European style concealed self-closing type, steel with satin finish.
  - 1. Doors 48" and over in height have 3 hinges per door.
  - 2. Manufacturers:
    - a. Grass America Inc: [www.grassusa.com](http://www.grassusa.com).
    - b. Hardware Resources: [www.hardwareresources.com](http://www.hardwareresources.com).
    - c. Julius Blum, Inc: [www.blum.com](http://www.blum.com).
    - d. Substitutions: See Section 01 6000 - Product Requirements.
- H. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- I. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
- J. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
- K. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Locate counter butt joints minimum 2 feet from sink cut-outs.
- L. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify adequacy of backing and support framing.
- B. Verify location and sizes of utility rough-in associated with work of this section.

### **3.02 INSTALLATION**

- A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
  - 1. Miter joints shall be clean and true, the entire visible surface shall be sanded parallel with the grain of the wood.
  - 2. Butting spaces shall be finished smooth.
- B. Use fixture attachments in concealed locations for wall mounted components.
- C. Use concealed joint fasteners to align and secure adjoining cabinet units and countertops.
  - 1. Install with minimum number of joints practical, using pieces from maximum lengths of product. Do not use pieces less than 24 inches (610 mm) long, except when necessary. Stagger joints in adjacent and related standing and running trim. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints. Plane backs of casings to provide uniform thickness joints, if required.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
- E. Secure cabinets and counter bases to floor using appropriate angles and anchorages.
- F. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
- G. Protect all millwork against the elements and damage in handling, construction, etc. The contractor will be liable for any such damage. All finish casing or trim that is applied to flat surfaces shall be hollowed out on the back 1/16" to within 1/2" of each edge. Saw Kerf the back of all pieces where necessary to prevent warping.
- H. Miscellaneous Items:
  - 1. Finish hardware: all cabinet hardware such as hinges, guides catches, pulls, shelf brackets, cabinet locks, etc., shall be furnished and installed under this section. Hinges shall be located as follows:
    - a. Top hinge: On doors more than 18" in height, position top of hinge 3" below top of door.
    - b. Bottom hinge: On doors more than 18" in height, position bottom of hinge 3" above bottom of door.
    - c. Intermediate hinge: Equal spacing between top and bottom hinges. Provide intermediate hinge on all doors 48" or more in height.
    - d. On doors 18" or less in height, mount top and bottom hinges at locations shown or as directed.
  - 2. Millwork: All cabinet work, counters, window trim, etc., shall be as detailed on the drawings. The workmanship of fabrication and erection shall be cabinet work, not joiner or carpenter work. All joints shall be glued. All surfaces not exposed to view may be any material that is suitable for the purposes intended. All work shall be completely fabricated in the shop, then disassembled, with each section clearly marked for location, for shipment and installation on the job site.
- I. All millwork shall be provided with cleats on the backs of cabinets for anchoring. All cabinets shall be furnished with attachment bases.
- J. Field drill holes for grommets in countertops for electrical and telephone cords. Verify locations of holes with Architect.

- K. Cover bottom edges of all drawer fronts, counter skirts etc. at knee spaces with plastic laminate to provide a smooth surface that will minimize snagging of staff clothing.
- L. Countertops will be field cut for sinks by the Finish Carpenters as called for under 06 2000.
- M. Fit all cabinets, countertops, shelving, etc., tightly to walls and/or floors as may be the case. Installation of millwork shall include cutting of countertops for sinks. Check locations and sizes with plumber. After millwork is in place, adjust doors and drawers as required for proper operation and alignment. Final adjustment of hinges shall include the installation of the adjustment screws for each hinge.

**3.03 ADJUSTING**

- A. Adjust installed work.
- B. Adjust moving or operating parts to function smoothly and correctly.

**3.04 CLEANING**

- A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

**END OF SECTION**

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**SECTION 07 0553  
FIRE AND SMOKE ASSEMBLY IDENTIFICATION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Identification markings for fire and smoke rated partitions, and fire rated walls.

**1.02 REFERENCE STANDARDS**

- A. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

**1.03 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed product literature for each type of marking, indicating font, foreground and background colors, wording, and overall dimensions.

**1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of experience.

**1.05 FIELD CONDITIONS**

- A. Do not install painted markings when ambient temperature is lower than recommended by coating manufacturer.

**PART 2 PRODUCTS**

**2.01 FIRE AND SMOKE ASSEMBLY IDENTIFICATION**

- A. Regulatory Requirements: Comply with "Marking and Identification" requirements of "Fire-Resistance Ratings and Fire Tests" chapter of ICC (IBC).
- B. Languages: Provide sign markings in English.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that substrate surfaces are ready to receive work.

**3.02 INSTALLATION**

- A. Locate markings as required by ICC (IBC).
- B. Install neatly, with horizontal edges level.
- C. Protect from damage until Date of Substantial Completion; repair or replace damaged markings.

**END OF SECTION**

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## **SECTION 07 8400 FIRESTOPPING**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Firestopping systems.
- B. Firestopping of joints and penetrations in fire-resistance-rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

#### **1.02 REFERENCE STANDARDS**

- A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2024.
- B. FM (AG) - FM Approval Guide; Current Edition.
- C. ITS (DIR) - Directory of Listed Products; Current Edition.
- D. UL (FRD) - Fire Resistance Directory; Current Edition.
- E. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.
- F. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.

#### **1.03 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance ratings, and limitations.
- C. UL Tested Systems: Submit drawings showing typical installation details for the methods of installation. Indicate which firestop materials will be used and thickness for different hourly ratings.
- D. Engineering Judgements: Submit manufacturer's drawings for all non-standard applications where no UL tested system exists. All drawings must indicate the "Tested" UL system upon which the judgement is based so as to assess the relevance of the judgement to some known performance.
- E. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- G. Certificate from authority having jurisdiction indicating approval of materials used.
- H. Installer's qualification statement.

#### **1.04 QUALITY ASSURANCE**

- A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
  - 1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
  - 2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at [www.icc-es.org](http://www.icc-es.org) will be considered as constituting an acceptable test report.
  - 3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.
- C. Installer Qualifications: Company specializing in performing the work of this section and:
  - 1. Verification of minimum three years experience installing work of this type.
  - 2. Licensed by local authorities having jurisdiction (AHJ).

- D. Firestop sealants upon curing, shall not re-emulsify, dissolve, leach, breakdown or otherwise be damaged over time from exposure to atmospheric moisture, sweating pipes, ponding water or other forms of moisture characteristic in a building's normal operating life.
- E. Firestop sealants selected shall be sufficiently flexible to accommodate motion such as pipe vibration, water-hammer, thermal expansion, and other normal building movement, without damage to the seal.
- F. One manufacturer shall supply all firestopping materials.
- G. All firestop materials shall be installed prior to expiration of shelf life.

#### **1.05 COORDINATION**

- A. Schedule firestopping after installation of penetrants but prior to concealing the openings.
- B. Firestopping shall precede gypsum board finishing.

#### **1.06 FIELD CONDITIONS**

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.
- B. Provide ventilation in areas where solvent-cured materials are being installed.
- C. Care should be taken to ensure that firestopping materials are installed so as not to contaminate adjacent surfaces.

### **PART 2 PRODUCTS**

#### **2.01 MATERIALS**

- A. Firestopping Materials: Any materials meeting requirements.
- B. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.

#### **2.02 FIRESTOPPING SYSTEMS**

- A. Firestopping: Any material meeting requirements.
  1. Fire Ratings: Use any system that is listed by UL (FRD) and tested in accordance with ASTM E814 with F Rating equal to fire rating of penetrated assembly, but not less than one hour, and minimum T Rating Equal to F Rating and in compliance with other specified requirements.
  2. The fire test shall be conducted with a minimum positive pressure differential of 0.01 inches of water column.
  3. For joints, must be tested to UL 2079 with movement capabilities equal to those of the anticipated conditions.
  4. Firestopping materials and systems must be capable of closing or filling through-openings created by 1) the burning or melting of combustible pipes, cable jacketing, or pipe insulation materials, or 2) deflection of sheet metal due to thermal expansion (electrical and mechanical duct work).
  5. Firestopping material shall be asbestos free and lead free and shall not incorporate nor require the use of hazardous solvents.
- B. Firestopping materials and systems shall meet the requirements specified herein.
- C. Architect must approve in writing any alternates to the materials and systems specified herein.
- D. All firestop products and systems shall be designed and installed so that the basic sealing system will allow the full restoration of the thermal and fire resistance properties of the barrier being penetrated with minimal repair if penetrants are subsequently removed.
- E. For applications where combustible penetrants are involved, i.e., insulated and plastic pipe, a suitable intumescent material must be used.

- F. All high-traffic openings (defined below) shall be firestopped with materials specifically designed for retrofit, such as intumescent firestop putty or pillows, and shall be labeled with warning stickers to alert future trades that the firestop materials must be replaced after removal.
  - 1. All cable tray penetrations.
  - 2. All voice, data and communications cabling.
  - 3. All sleeved cabling openings.
  - 4. Other conditions when noted in drawings.

### **2.03 MATERIALS**

- A. Firestopping Sealants: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
- B. Manufacturers:
  - 1. Note: Inclusion of materials in this specification does not indicate that the listed products have been evaluated for conformance to this specification. Therefore, the user/contractor must certify in the submittal package, with a "Certificate of Conformance" from the manufacturer listed below, that the material selected meets all of the criteria set forth in the "Quality Assurance" Section of this specification.
  - 2. 3M Fire Protection Products: [www.3m.com/firestop](http://www.3m.com/firestop).
  - 3. SpecSeal by STI. Specified Technologies Inc., Somerville, NJ 08876.
  - 4. Pensil by General Electric, Construction Silicones Division. Specified Technologies Inc., Somerville, NJ 08876.
  - 5. FireBarrier by Minnesota Mining and Manufacturing, Fire Protection Products, Building 225-4N-07, St. Paul, MN 55144.
  - 6. FlameSafe by Grace Construction Products, Cambridge, MA.
  - 7. Hilti Firestop Systems by Hilti Corporation.
  - 8. Approved equal.

## **PART 3 EXECUTION**

### **3.01 CONDITIONS REQUIRING FIRESTOPPING**

- A. General: Provide firestopping for conditions specified whether or not firestopping is indicated, and if indicated, whether such materials designated as insulation, safing, or otherwise.
- B. Through-Penetrations: Firestopping shall be installed in all open penetrations and in the annular space in all penetrations in any bearing or non-bearing fire-rated barrier.
- C. Membrane-Penetrations: Where required by code, all membrane-penetrations in rated walls shall be protected with firestopping products that meet the requirements of third party time/temperature testing.
- D. Construction Joints/Gaps: Firestopping shall be provided at all fire rated walls as indicated on project drawings.
  - 1. Between the tops of walls and the underside of floors.
  - 2. In expansion joints at fire rated walls.
  - 3. In any penetration through fire rated wall fill gaps, spaces with fire stopping material sufficient to maintain intended wall rating.
  - 4. Smoke-Stopping: As required by the other Sections, Smoke-Stops shall be provided for Through-Penetrations, Membrane-Penetrations, and Construction Gaps with a material approved and tested for such application.

### **3.02 EXAMINATION**

- A. Verify openings are ready to receive the work of this section.
- B. Verify that all pipe, conduit, cable and other items which penetrate fire-rated construction have been permanently installed prior to installation of firestops.

### **3.03 PREPARATION**

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.
- B. Remove incompatible materials that could adversely affect bond.
- C. Install backing materials to prevent liquid material from leakage.

### **3.04 INSTALLATION**

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- B. Do not cover installed firestopping until inspected by authorities having jurisdiction.
- C. Pipe insulation shall not be removed, cut away, or otherwise interrupted through wall or floor openings. Firestop systems selected shall be appropriately tested for the thickness and type of insulation being sealed.
- D. Install labeling required by code.
- E. Firestop sealant shall be properly tooled to insure that both the proper sealant depth is maintained in the annular space, and that the adhesive bond to both the penetrating item, and the surrounding construction is achieved.
- F. All electrical, mechanical, and other service items (such as ABS DWV stacks) inside interior walls that penetrate through hourly rated wood-floor assemblies shall be firestopped with materials that have both a one hour F and a one hour T rating, in accordance with ASTM E814 (UL 1479).

### **3.05 CLEANING**

- A. Clean adjacent surfaces of firestopping materials.

### **3.06 PROTECTION**

- A. Protect adjacent surfaces from damage by material installation.

**END OF SECTION**

## **SECTION 07 9200 JOINT SEALANTS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Spray-applied joint sealants.
- B. Nonsag gunnable joint sealants.
- C. Self-leveling pourable joint sealants.
- D. Joint backings and accessories.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 09 2116 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.

#### **1.03 REFERENCE STANDARDS**

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015 (Reapproved 2022).
- B. ASTM C834 - Standard Specification for Latex Sealants; 2017 (Reapproved 2023).
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).
- D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.
- E. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- G. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2022).

#### **1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:
  - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
  - 2. List of backing materials approved for use with the specific product.
  - 3. Backing material recommended by sealant manufacturer.
  - 4. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
  - 5. Substrates the product should not be used on.
  - 6. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
- C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
- D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
- E. Executed warranty.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.
- B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of experience.

## 1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 2-year manufacturer warranty for installed sealants and accessories that fail to achieve a watertight seal, exhibit loss of adhesion or cohesion, or do not cure. Complete forms in Owner's name and register with manufacturer.
- C. Extended Correction Period: Correct defective work within 5-year period commencing on Date of Substantial Completion.

## PART 2 PRODUCTS

### 2.01 JOINT SEALANT APPLICATIONS

- A. Scope:
  - 1. Exterior Joints:
    - a. Seal the following joints:
      - 1) Wall expansion and control joints.
      - 2) Joints between doors, windows, and other frames or adjacent construction.
      - 3) Joints between different exposed materials.
  - 2. Interior Joints:
    - a. Do not seal interior joints indicated on drawings as not sealed.
    - b. Do not seal through-penetrations in sound-rated assemblies that are also fire-rated assemblies.
    - c. Seal the following joints:
      - 1) Joints between door frames, window frames, and other frames and adjacent construction.
      - 2) In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping penetrations, and other openings.
  - 3. Do Not Seal:
    - a. Intentional weep holes in masonry.
    - b. Joints indicated to be covered with expansion joint cover assemblies.
    - c. Joints where sealant is specified to be furnished and installed by manufacturer of product to be sealed.
    - d. Joints where sealant installation is specified in other sections.
    - e. Joints between suspended ceilings and walls.
- B. Exterior Joints: Use nonsag nonstaining silicone sealant, unless otherwise indicated.
  - 1. Lap Joints in Sheet Metal Fabrications: Butyl rubber, noncuring.
  - 2. Lap Joints between Manufactured Metal Panels: Butyl rubber, noncuring.
- C. Interior Joints: Use nonsag polyurethane sealant, unless otherwise indicated.
  - 1. Wall and Ceiling Joints in Nonwet Areas: Acrylic emulsion latex sealant.
  - 2. Wall and Ceiling Joints in Wet Areas: Nonsag polyurethane sealant for continuous liquid immersion.
  - 3. Wall, Ceiling, and Floor Joints Where Tamper-Resistance is Required: Non-sag tamper-resistant silyl-terminated polyurethane sealant.
  - 4. Joints between Tile in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; white.
  - 5. In Sound-Rated Assemblies: Acrylic emulsion latex sealant.
  - 6. Narrow Control Joints in Interior Concrete Slabs: Self-leveling epoxy sealant.
  - 7. Other Floor Joints: Self-leveling polyurethane traffic-grade sealant.
- D. Interior Wet Areas: restrooms and food service areas; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, and other similar items.

### 2.02 JOINT SEALANTS - GENERAL

- A. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.

### **2.03 SPRAY-APPLIED JOINT SEALANTS**

- A. Spray-Applied Water-Based Acrylic Latex Sealant: For interior applications, spray-applied, fast-drying, premixed acrylic latex sealant, intended for air sealing penetrations and joints.
  - 1. Surface Burning Characteristics: Smoke developed index of 450 or less, and flame spread index of 25 or less, Class A, when tested in accordance with ASTM E84.
  - 2. Spray Equipment: Use rate of application and methods as recommended by manufacturer.

### **2.04 NONSAG JOINT SEALANTS**

- A. Nonstaining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
  - 1. Movement Capability: Plus and minus 50 percent, minimum.
  - 2. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
  - 3. Color: Match adjacent finished surfaces.
- B. Silicone Sealant: ASTM C920, Grade NS, Use T; single component, explicitly approved by manufacturer for traffic exposure when recessed below traffic surface; not expected to withstand continuous water immersion.
  - 1. Movement Capability: Plus 100 percent and minus 50 percent, minimum.
- C. Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
  - 1. Movement Capability: Plus and minus 50 percent, minimum.
  - 2. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
  - 3. Color: Match adjacent finished surfaces.
- D. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
  - 1. Color: White.
- E. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
  - 1. Movement Capability: Plus and minus 50 percent, minimum.
  - 2. Color: Match adjacent finished surfaces.
- F. Polyurethane Sealant for Continuous Water Immersion: ASTM C920, Grade NS, Uses M and A; single or multicomponent; explicitly approved by manufacturer for continuous water immersion; suitable for traffic exposure when recessed below traffic surface.
  - 1. Movement Capability: Plus and minus 35 percent, minimum.
- G. Acrylic Emulsion Latex: Water-based; ASTM C834, single component, nonstaining, nonbleeding, nonsagging; not intended for exterior use.
  - 1. Color: Standard colors matching finished surfaces, Type OP (opaque).

### **2.05 SELF-LEVELING JOINT SEALANTS**

- A. Self-Leveling Polyurethane Sealant for Continuous Water Immersion: Polyurethane; ASTM C920, Grade P, Uses M and A; single component; explicitly approved by manufacturer for traffic exposure and continuous water immersion.
  - 1. Movement Capability: Plus and minus 25 percent, minimum.
- B. Semi-Rigid Self-Leveling Epoxy Joint Filler: Epoxy or epoxy/polyurethane copolymer; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.
  - 1. Composition: Multicomponent, 100 percent solids by weight.
  - 2. Durometer Hardness: Minimum of 85 for Type A or 35 for Type D, after seven days when tested in accordance with ASTM D2240.
  - 3. Joint Width, Minimum: 1/8 inch.

## **2.06 ACCESSORIES**

- A. Sealant Backing Materials, General: Materials placed in joint before applying sealants; assists sealant performance and service life by developing optimum sealant profile and preventing three-sided adhesion; type and size recommended by sealant manufacturer for compatibility with sealant, substrate, and application.
- B. Overlay Extrusion for Glazing System Joint Protection: Rubber profiled extrusions placed over joints in glazing system and provided with watertight seal.
  - 1. Profile: As required to match existing metal glazing cap requirements.
- C. Preformed Extruded Silicone Joint Seal: Pre-cured low-modulus silicone extrusion, in sizes to fit applications indicated on drawings, combined with a neutral-curing liquid silicone sealant for bonding joint seal to substrates.
  - 1. Size: 1 inch wide, in rolls 100 feet long.
  - 2. Thickness: 0.78 inch, with ridges along outside bottom edges for bonding area.
- D. Preformed Extruded Polyurethane Joint Seal: Medium-modulus, preformed polyurethane extrusion used to bridge joints under elastomeric wall coatings, in sizes to fit applications indicated on drawings, combined with polyurethane sealant for bonding joint seal to substrates.
  - 1. Size: 1-1/2 inch wide, in rolls 100 feet long.
  - 2. Thickness: 0.051 inch, with ridges along outside bottom edges for bonding area.
- E. Masking Tape: Self-adhesive, nonabsorbent, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.

### **3.02 PREPARATION**

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

### **3.03 INSTALLATION**

- A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Provide joint sealant installations complying with ASTM C1193.
- C. Install bond breaker backing tape where backer rod cannot be used.
- D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- E. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
- F. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.
- G. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

## **END OF SECTION**

**SECTION 08 1113  
HOLLOW METAL DOORS AND FRAMES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Non-fire-rated hollow metal doors and frames.
- B. Hollow metal frames for wood doors.
- C. Fire-rated hollow metal doors and frames.
- D. Thermally insulated hollow metal doors with frames.
- E. Hollow metal borrowed lites glazing frames.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 7100 - Door Hardware.
- B. Section 08 8000 - Glazing: Glass for doors and borrowed lites.

**1.03 ABBREVIATIONS AND ACRONYMS**

- A. ANSI: American National Standards Institute.
- B. HMMA: Hollow Metal Manufacturers Association.
- C. NFPA: National Fire Protection Association.
- D. SDI: Steel Door Institute.
- E. UL: Underwriters Laboratories.

**1.04 REFERENCE STANDARDS**

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2026.
- C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames; 2024.
- D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2023.
- E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2025.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025.
- G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2024.
- H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2023.
- I. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.
- J. ASTM C476 - Standard Specification for Grout for Masonry; 2023.
- K. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.
- L. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- M. ITS (DIR) - Directory of Listed Products; Current Edition.
- N. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
- O. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2024.

- P. NAAMM HMMA 840 - Guide Specifications for Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2024.
- Q. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2014.
- R. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025, with Amendment (2024).
- S. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.
- T. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2023.
- U. UL (DIR) - Online Certifications Directory; Current Edition.
- V. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

### **1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
- D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

### **1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of experience.
- C. Maintain at project site copies of reference standards relating to installation of products specified.

### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Hollow Metal Doors and Frames:
  1. Ceco Door, an Assa Abloy Group company: [www.assaabloydss.com/#sle](http://www.assaabloydss.com/#sle).
  2. Curries, an Assa Abloy Group company: [www.assaabloydss.com/#sle](http://www.assaabloydss.com/#sle).
  3. Pioneer Industries, an Assa Abloy Group Company: [www.pioneerindustries.com](http://www.pioneerindustries.com).
  4. Republic Doors, an Allegion brand: [www.republicdoor.com/#sle](http://www.republicdoor.com/#sle).
  5. Steelcraft, an Allegion brand: [www.allegion.com/#sle](http://www.allegion.com/#sle).
  6. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 PERFORMANCE REQUIREMENTS**

- A. Requirements for Hollow Metal Doors and Frames:
  1. Steel Sheet: Comply with one or more of the following requirements; galvanized steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.

2. Accessibility: Comply with ICC A117.1 and ADA Standards.
  3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
  4. Door Edge Profile: Manufacturers standard for application indicated.
  5. Typical Door Face Sheets: Flush.
  6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Flush.
  7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

### 2.03 HOLLOW METAL DOORS

- A. Door Finish: Factory primed and field finished.
- B. Exterior Doors: Thermally insulated.
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    - a. Level 3 - Extra Heavy-duty.
    - b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
    - c. Model 2 - Seamless.
    - d. Door Face Metal Thickness: 16 gauge, 0.053 inch, minimum.
    - e. Zinc Coating: A60/ZF180 galvanized coating; ASTM A653/A653M.
  2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
  3. Door Thickness: 1-3/4 inches, nominal.
- C. Interior Doors, Non-Fire-Rated:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    - a. Level 2 - Heavy-duty.
    - b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
    - c. Model 2 - Seamless.
    - d. Door Face Metal Thickness: 18 gauge, 0.042 inch, minimum.
  2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
  3. Door Thickness: 1-3/4 inches, nominal.
- D. Fire-Rated Doors:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    - a. Level 2 - Heavy-duty.
    - b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
    - c. Model 2 - Seamless.
    - d. Door Face Metal Thickness: 18 gauge, 0.042 inch, minimum.
  2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
  3. Provide units listed and labeled by UL (DIR) or ITS (DIR).
    - a. Attach fire rating label to each fire rated unit.
  4. Door Core Material: Manufacturers standard core material/construction in compliance with requirements.
  5. Door Thickness: 1-3/4 inches, nominal.

## **2.04 HOLLOW METAL FRAMES**

- A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
- B. Frame Finish: Factory primed and field finished.
- C. Exterior Door Frames: Full profile/continuously welded type.
  - 1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
  - 2. Frame Metal Thickness: 14 gauge, 0.067 inch, minimum.
  - 3. Weatherstripping: Separate, see Section 08 7100.
- D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
  - 1. Frame Metal Thickness: 16 gauge, 0.053 inch, minimum.
- E. Door Frames, Fire-Rated: Full profile/continuously welded type.
  - 1. Fire Rating: Same as door, labeled.
  - 2. Frame Metal Thickness: 14 gauge, 0.067 inch, minimum.
- F. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.
- G. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.
- H. Transom Bars: Fixed, of profile same as jamb and head.
- I. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
- J. Frames Wider than 48 inches: Reinforce with steel channel fitted tightly into frame head, flush with top.

## **2.05 FINISHES**

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
- B. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15 mil, 0.015 inch dry film thickness (DFT) per coat; provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
  - 1. Fire-Rated Frames: Comply with fire rating requirements indicated.

## **2.06 ACCESSORIES**

- A. Door Window Frames: Door window frames with glazing securely fastened within door opening.
  - 1. Size: As indicated on drawings.
  - 2. Frame Material: 18 gauge, 0.0478 inch, galvanized steel, with finish to match door.
- B. Glazing: As specified in Section 08 8000.
- C. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.
- D. Astragals for Double Doors: Specified in Section 08 7100.
- E. Grout for Frames: Mortar grout complying with ASTM C476 with maximum slump of 4 inches as measured in accordance with ASTM C143/C143M for hand troweling in place; plaster grout and thinner pumpable grout are prohibited.
- F. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.
- G. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

### **3.02 PREPARATION**

- A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

### **3.03 INSTALLATION**

- A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
- B. Install fire rated units in accordance with NFPA 80.
- C. Coordinate frame anchor placement with wall construction.
- D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
- E. Install door hardware as specified in Section 08 7100.
  - 1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.
- F. Comply with glazing installation requirements of Section 08 8000.
- G. Coordinate installation of electrical connections to electrical hardware items.

### **3.04 TOLERANCES**

- A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.
- B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

### **3.05 ADJUSTING**

- A. Adjust for smooth and balanced door movement.

### **3.06 SCHEDULE**

- A. Refer to Door and Frame Schedule on the drawings.

**END OF SECTION**

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**SECTION 08 1416  
FLUSH WOOD DOORS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Flush wood doors; flush and flush glazed configuration; fire-rated and non-rated.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 1113 - Hollow Metal Doors and Frames.
- B. Section 08 7100 - Door Hardware.
- C. Section 08 8000 - Glazing .
- D. Section 08 8813 - Fire-Rated Glazing.

**1.03 REFERENCE STANDARDS**

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- C. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025, with Amendment (2024).
- D. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
- D. Samples: Submit two samples of door veneer, 2 by 3 inches in size illustrating wood grain, stain color, and sheen.
- E. Certificate: Submit labels and certificates required by quality assurance and quality control programs.
- F. Manufacturer's Installation Instructions: Indicate special installation instructions.
- G. Warranty, executed in Owner's name.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of experience.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging, and inspect for damage.
- C. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

**1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

- B. Manufacturer Warranty: Provide manufacturer's warranty on interior doors for the life of the installation. Complete forms in Owner's name and register with manufacturer.
  - 1. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Wood Veneer Faced Doors:
  - 1. Algoma Hardwoods: [www.algomahardwoods.com](http://www.algomahardwoods.com).
  - 2. Eggers Industries: [www.eggersindustries.com](http://www.eggersindustries.com).
  - 3. Graham Wood Doors: [www.grahamdoors.com](http://www.grahamdoors.com).
  - 4. VT Industries, Inc: [www.vtindustries.com/#sle](http://www.vtindustries.com/#sle).
  - 5. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 DOORS**

- A. Doors: See drawings for locations and additional requirements.
  - 1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
  - 2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
- B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
  - 1. Provide solid core doors at each location.
  - 2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with UL 10C - Positive Pressure; Underwriters Laboratories Inc (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.

### **2.03 DOOR AND PANEL CORES**

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.
- B. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

### **2.04 DOOR FACINGS**

- A. Veneer Facing for Transparent Finish: Red oak, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.
  - 1. Vertical Edges: Same species as face veneer.
  - 2. "Pair Match" each pair of doors; "Set Match" pairs of doors within 10 feet of each other when doors are closed.

### **2.05 DOOR CONSTRUCTION**

- A. Fabricate doors in accordance with door quality standard specified.
- B. Cores Constructed with stiles and rails:
  - 1. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.
  - 2. Provide solid blocking for other throughbolted hardware.
- C. Where supplementary protective edge trim is required, install trim after veneer facing has been applied full-width.
- D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
- E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
- F. Provide edge clearances in accordance with the quality standard specified.

## **2.06 FINISHES - WOOD VENEER DOORS**

- A. Finish work in accordance with AWI/AWMA/WI (AWS) or AWMA/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
  - 1. Transparent:
    - a. System - 9, UV Curable, Acrylated Epoxy, Polyester or Urethane.
    - b. Stain: As selected by Architect.
    - c. Sheen: Flat.
- B. Factory finish doors in accordance with approved sample.
- C. Seal door top edge with color sealer to match door facing.

## **2.07 ACCESSORIES**

- A. Hollow Metal Door Frames: See Section 08 1113.
- B. Glazing: See Section 08 8000.
- C. Glazing Stops: Wood, of same species as door facing, mitered corners; prepared for countersink style tamper proof screws.
- D. Door Hardware: See Section 08 7100.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

### **3.02 INSTALLATION**

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
  - 1. Install fire-rated doors in accordance with NFPA 80 requirements.
- B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
- C. Use machine tools to cut or drill for hardware.
- D. Coordinate installation of doors with installation of frames and hardware.
- E. Coordinate installation of glazing.

### **3.03 TOLERANCES**

- A. Comply with specified quality standard for fit and clearance tolerances.
- B. Comply with specified quality standard for telegraphing, warp, and squareness.

### **3.04 ADJUSTING**

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

**END OF SECTION**

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**SECTION 08 8000  
GLAZING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Insulating glass units.
- B. Glazing units.
- C. Glazing compounds.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 9200 - Joint Sealants: Sealants for other than glazing purposes.
- B. Section 08 1113 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.
- C. Section 08 1416 - Flush Wood Doors: Glazed lites in doors.
- D. Section 08 8813 - Fire-Rated Glazing.

**1.03 REFERENCE STANDARDS**

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).
- C. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).
- D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).
- E. ASTM C1036 - Standard Specification for Flat Glass; 2025.
- F. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.
- G. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.
- H. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2021a.
- I. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2024.
- J. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2019.
- K. GANA (GM) - GANA Glazing Manual; 2022.
- L. GANA (SM) - GANA Sealant Manual; 2008.
- M. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (Reaffirmed 2016).
- N. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2023.
- O. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2023.
- P. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2026.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data on Insulating Glass Unit and Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.

- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Samples: Submit two samples 12 by 12 inch in size of glass units.
- E. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

#### **1.05 QUALITY ASSURANCE**

- A. Perform work in accordance with GANA (GM), GANA (SM), and IGMA TM-3000 for glazing installation methods.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum 3 years of experience.
- C. Installer Qualifications: Company specializing in performing work of type specified, with minimum 3 years of experience.

#### **1.06 FIELD CONDITIONS**

- A. Do not install glazing when ambient temperature is less than 40 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

#### **1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Insulating Glass Units: Provide a ten (10) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Glass Fabricators:
  1. AGC Glass North America, Inc.: [www.agcglass.com](http://www.agcglass.com).
  2. Cardinal Glass Industries: [www.cardinalcorp.com](http://www.cardinalcorp.com).
  3. Guardian Glass, LLC: [www.guardianglass.com](http://www.guardianglass.com).
  4. Oldcastle Building Envelope: [www.obe](http://www.obe)
  5. Pilkington North America Inc.: [www.pilkington.com](http://www.pilkington.com).
  6. Viracon, Inc: [www.viracon.com/#sle](http://www.viracon.com/#sle).
  7. Vitro Architectural Glass (formerly PPG Glass): [www.vitroglazings.com](http://www.vitroglazings.com).
  8. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES**

- A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
  1. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
  2. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
  3. Glass thicknesses listed are minimum.
- B. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.
- C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
  1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 7 computer program.

2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 7 computer program.
3. Solar Optical Properties: Comply with NFRC 300 test method.

### 2.03 GLASS MATERIALS

- A. Float Glass: Provide float glass based glazing unless otherwise indicated.
  1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.
  2. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
  3. Kind FT - Fully Tempered Type: Complies with ASTM C1048.
  4. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.
  5. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.

### 2.04 INSULATING GLASS UNITS

- A. Manufacturers:
  1. Glass: Any of the manufacturers specified for float glass.
- B. Insulating Glass Units: Types as indicated.
  1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
  2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
  3. Warm-Edge Spacers: Polypropylene warm-edge technology design.
    - a. Spacer Width: As required for specified insulating glass unit.
    - b. Spacer Height: Manufacturer's standard.
  4. Spacer Color: Black.
  5. Edge Seal:
    - a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.
    - b. Color: Black.
  6. Purge interpane space with dry air, hermetically sealed.
- C. Type A - Insulating Glass Units: Vision glass, double glazed.
  1. Space between lites filled with argon.
  2. Outboard Lite: Heat-strengthened float glass, 1/4 inch thick, minimum.
    - a. Tint: Clear.
    - b. Coating: Low-E (passive type), on #2 surface.
      - 1) Guardian Industries; SunGuard SuperNeutral 68.
      - 2) PPG Industries; Solarban 60.
      - 3) Viracon; VE-2M
      - 4) Substitutions: Refer to Section 01 6000 - Product Requirements.
  3. Inboard Lite: Heat-strengthened float glass, 1/4 inch thick, minimum.
    - a. Tint: Clear.
    - b. Coating: Low-E, on #4 surface.
      - 1) Guardian Industries: IS20.
      - 2) Pilkington: Energy Advantage.
      - 3) Viracon: Roomside Low-E.
      - 4) Substitutions: Refer to Section 01 6000 - Product Requirements.
  4. Total Thickness: 1 inch.
  5. Thermal Transmittance (U-Value), Winter - Center of Glass: 0.29, maximum.
  6. Visible Light Transmittance (VLT): 68 percent, nominal.
  7. Solar Heat Gain Coefficient (SHGC): 25, maximum.

## **2.05 GLAZING UNITS**

- A. Type B - Monolithic Interior Vision Glazing:
  - 1. Applications: As scheduled.
  - 2. Glass Type: Fully tempered float glass.
  - 3. Tint: Clear.
  - 4. Thickness: 1/4 inch, nominal.
- B. Type C - Monolithic Safety Glazing: Non-fire-rated.
  - 1. Applications:
    - a. Glazed lites in doors, except fire doors.
    - b. Glazed sidelights to doors, except in fire-rated walls and partitions.
    - c. Other locations required by applicable federal, state, and local codes and regulations.
    - d. Other locations indicated on drawings.
  - 2. Glass Type: Fully tempered safety glass as specified.
  - 3. Tint: Clear.
  - 4. Thickness: 1/4 inch, nominal.

## **2.06 GLAZING COMPOUNDS**

- A. Type GC-2 - Butyl Sealant: Single component; ASTM C920 Grade NS, Class 12-1/2, Uses M and A, Shore A hardness of 10 to 20; black color.
- B. Type GC-5 - Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; nonbleeding, nonstaining; ASTM C920 Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

## **2.07 ACCESSORIES**

- A. Setting Blocks: Neoprene, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.
- C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
- D. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.
- E. Glazing Clips: Manufacturer's standard type.

## **PART 3 EXECUTION**

### **3.01 VERIFICATION OF CONDITIONS**

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

### **3.02 PREPARATION**

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

### **3.03 INSTALLATION, GENERAL**

- A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.
- B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.

### **3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)**

- A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

### **3.05 INSTALLATION - DRY GLAZING METHOD (TAPE AND GASKET SPLINE GLAZING)**

- A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.
- B. Cut glazing tape to length; install on glazing pane. Seal corners by butting tape and sealing junctions with butyl sealant.
- C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- D. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
- E. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.
- F. Carefully trim protruding tape with knife.

### **3.06 CLEANING**

- A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- B. Remove nonpermanent labels immediately after glazing installation is complete.
- C. Clean glass and adjacent surfaces after sealants are fully cured.
- D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

### **3.07 PROTECTION**

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.
- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

**END OF SECTION**

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**SECTION 08 8813  
FIRE-RATED GLAZING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Fire-rated glazing units.
- B. Glazing compounds.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 9200 - Joint Sealants: Sealants for other than glazing purposes.
- B. Section 08 1416 - Flush Wood Doors: Glazed lites in doors.

**1.03 REFERENCE STANDARDS**

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).
- C. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).
- D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.
- E. GANA (SM) - GANA Sealant Manual; 2008.
- F. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. ITS (DIR) - Directory of Listed Products; Current Edition.
- H. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.
- I. NFPA 257 - Standard on Fire Test for Window and Glass Block Assemblies; 2022.
- J. UL (DIR) - Online Certifications Directory; Current Edition.
- K. UL 9 - Standard for Fire Tests of Window Assemblies; Current Edition, Including All Revisions.
- L. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- M. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data on Glazing Unit Glazing Types: Provide structural, physical, and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Certificate: Certify that products of this section meet or exceed specified requirements.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of experience.
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of experience.

**1.06 FIELD CONDITIONS**

- A. Ambient Conditions: Do not install glazing when ambient temperature is less than 40 degrees F.

- B. Maintain minimum ambient temperature before, during, and 24 hours after installation of glazing compounds.

## **PART 2 PRODUCTS**

### **2.01 GLASS MATERIALS**

- A. Float Glass: Provide float glass based glazing unless otherwise indicated.
  - 1. Impact-Resistant Safety Glass: Comply with ANSI Z97.1 - Class A, or 16 CFR 1201 - Category I and II criteria.

### **2.02 GLAZING UNITS**

- A. Type D - Fire-Protection-Rated Glazing: Type, thickness, and configuration of glazing that contains flame, smoke, and does not block radiant heat, as required to achieve indicated fire rating period as indicated on drawings.
  - 1. Applications:
    - a. Glazing in fire-resistance-rated door assembly.
  - 2. Glass Type: Safety ceramic glass.
  - 3. Provide products listed by ITS (DIR) or UL (DIR) and approved by authorities having jurisdiction.
  - 4. Safety Glazing Certification: 16 CFR 1201 Category II.
  - 5. Glazing Method: As required for fire rating.
  - 6. Fire-Rating Period: As indicated on drawings.
  - 7. Markings for Fire-Protection-Rated Glazing Assemblies: Provide permanent markings on fire-protection-rated glazing in compliance with ICC (IBC), local building code, and authorities having jurisdiction
    - a. "D" - meets fire door assembly criteria of NFPA 252, UL 10B, or UL 10C fire test standards.
    - b. "OH" - meets fire window assembly criteria, including hose stream test of NFPA 257 or UL 9 fire test standards.
    - c. "H" - meets fire door assembly hose stream test of NFPA 252, UL 10B, or UL 10C fire tests standards.
    - d. "XXX" - placeholder that represents fire-rating period, in minutes.
  - 8. Products:
    - a. SCHOTT North America Inc; PYRAN Platinum F (Surface-Applied Safety Film): [www.us.schott.com/#sle](http://www.us.schott.com/#sle).
    - b. Technical Glass Products; Firelite NT: [www.fireglass.com/#sle](http://www.fireglass.com/#sle).
    - c. Substitutions: See Section 01 6000 - Product Requirements.

### **2.03 ACCESSORIES**

- A. Setting Blocks: Calcium silicate, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.
- B. Glazing Tape: Closed-cell polyvinyl chloride (PVC) foam, coiled on release paper over adhesive on two sides.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that minimum required face and edge clearances are provided.
- C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

- D. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

### **3.03 INSTALLATION - GENERAL**

- A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers unless more stringent requirements are indicated, including those in referenced glazing standards.
- B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.
- C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.
- D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.
- E. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.
- F. Prevent glass from contact with contaminating substances that may result from construction operations including, but not limited to weld spatter, fire-safing, plastering, mortar droppings, etc.

### **3.04 INSTALLATION - DRY GLAZING METHOD (TAPE AND TAPE)**

- A. Application - Interior Glazed: Set glazing infills from interior of building.
- B. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sightline.
- C. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
- D. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
- E. Place glazing tape on free perimeter of glazing in same manner described above.
- F. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- G. Carefully trim protruding tape with knife.

### **3.05 CLEANING**

- A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.
- B. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- C. Remove nonpermanent labels immediately after glazing installation is complete.
- D. Clean glass and adjacent surfaces after sealants are fully cured.
- E. Clean glass on both exposed surfaces not more than four days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

### **3.06 PROTECTION**

- A. After installation, mark pane with 'X' by using removable plastic tape or paste.
- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

**END OF SECTION**

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**SECTION 09 2116  
GYPSUM BOARD ASSEMBLIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Performance criteria for gypsum board assemblies.
- B. Metal stud wall framing.
- C. Metal channel ceiling framing.
- D. Acoustic insulation.
- E. Cementitious backing board.
- F. Gypsum wallboard.
- G. Joint treatment and accessories.
- H. Top of Wall Insulation between Flutes of Steel Decking.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.

**1.03 REFERENCE STANDARDS**

- A. AISI S201 - North American Standard for Cold-Formed Steel Framing - Product Data; 2017.
- B. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.
- C. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).
- D. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2019 (Reapproved 2025).
- E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025.
- F. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.
- G. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).
- H. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2024.
- I. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.
- J. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2025.
- K. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.
- L. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2024.
- M. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2024.
- N. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
- O. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- P. ASTM E413 - Classification for Rating Sound Insulation; 2022.
- Q. GA-216 - Application and Finishing of Gypsum Panel Products; 2024.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination: Coordinate the installation of gypsum board assemblies with size, location, and installation of service utilities.
- B. Sequencing: Install service utilities in an orderly and expeditious manner.

#### **1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data:
  - 1. Provide data on metal framing, gypsum board, accessories, and joint finishing system.
  - 2. Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- C. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.
  - 1. Submit drawings indicating control joint locations.

#### **1.06 QUALITY ASSURANCE**

- A. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of experience.
- B. Documents at Project Site: Maintain at the project site a copy of manufacturer's instructions, erection drawings, and shop drawings.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Store gypsum products and accessories indoors and keep above freezing. Elevate boards above floor, on nonwicking supports, in accordance with manufacturer's recommendations.
- B. Store metal products to prevent corrosion, under cover and above grade.

### **PART 2 PRODUCTS**

#### **2.01 GYPSUM BOARD ASSEMBLIES**

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
- B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
  - 1. Acoustic Attenuation: STC as indicated calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- C. Fire-Resistance-Rated Assemblies: Provide completed assemblies complying with applicable code.

#### **2.02 METAL FRAMING MATERIALS**

- A. Material and Product Requirements: AISI S201 and AISI S220.
- B. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S220 or equivalent.
  - 1. Structural Grade: As required to meet design criteria.
  - 2. Corrosion Protection Coating Designation: G90, or equivalent in accordance with AISI S220.
- C. Manufacturers - Metal Framing, Connectors, and Accessories:
  - 1. ClarkDietrich: [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).
  - 2. MarinoWARE: [www.marinoware.com/#sle](http://www.marinoware.com/#sle).
  - 3. SCAFCO Corporation: [www.scafco.com/#sle](http://www.scafco.com/#sle).
  - 4. Steel Construction Systems: [www.steelconsystems.com/#sle](http://www.steelconsystems.com/#sle).
  - 5. The Steel Network, Inc.: [www.steelnetwork.com](http://www.steelnetwork.com).
  - 6. Substitutions: See Section 01 6000 - Product Requirements.
- D. Nonstructural Framing System Components: AISI S220; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf. Light gauge materials shall be manufactured from

structural quality steel having a minimum yield strength of 50,000 psi for 16 gauge thickness or heavier and 33,000 psi for 18 gauge or lighter.

1. Steel Stud Gauges:
  - a. Interior Studs:
    - 1) 3 5/8" studs:
      - (a) 25 gauge up to 12 feet in height.
      - (b) 20 gauge when over 12 feet and up to 15 feet in height. Provide lateral bracing at 4'-0" o.c. maximum.
    - 2) 6" studs:
      - (a) 22 gauge up to 16 feet in height.
      - (b) 20 gauge when over 16 feet and up to 22 feet in height. Provide lateral bracing at 4'-0" o.c. maximum.
    - 3) Provide slip track deflection system at all top track to accommodate 1/2" deflection.
    - 4) Structural studs and framing studs at doorways shall be 20 gauge. Wall reinforcing shall be black iron channels or as required.
  - b. Exterior Studs:
    - 1) For all exterior walls use 6" 18 gauge studs and top or bottom track installed at 16" oc with horizontal attached lateral bracing at 4'-0" oc vertically. All fastening shall be by #10 screws or by welding. Provide deflection at top track of 1/2" at each stud. Refer to structural drawings for exterior stud wall gauges at face brick and metal panel veneers.
    - 2) Galvanized in accordance with ASTM A653/A653M, G90/Z275 coating.
2. Studs: C-shaped with knurled or embossed faces.
3. Runners: U shaped, sized to match studs.
4. Ceiling Channels: C-shaped.
5. Furring Members: Hat-shaped sections, minimum depth of 7/8 inch.
6. Furring Members: Zee-shaped sections, minimum depth of 1 inch.
- E. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and screwed to secondary deflection channel set inside but unattached to top track.
- F. Nonstructural Framing Accessories:
  1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
  2. Wire Ties and Hangers: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.062 inch thick.
    - a. Carrying Channels: Cold-rolled steel, 2 inches or 1-1/2 inches deep - see drawings.
    - b. Furring Channels: 3/4 inch deep, cold-rolled channels, 22 gauge steel studs in depth indicated, or steel rigid hat-shaped channels, 3/4 inch deep as required.

## 2.03 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
  1. American Gypsum Company: [www.americangypsum.com/#sle](http://www.americangypsum.com/#sle).
  2. CertainTeed Corporation: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
  3. Georgia-Pacific Gypsum: [www.gpgypsum.com/#sle](http://www.gpgypsum.com/#sle).
  4. Gold Bond Building Products, LLC provided by National Gypsum Company: [www.goldbondbuilding.com/#sle](http://www.goldbondbuilding.com/#sle).
  5. USG Corporation: [www.usg.com/#sle](http://www.usg.com/#sle).
  6. Substitutions: See Section 01 6000 - Product Requirements.
- B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
  1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
  2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.

- a. Mold-resistant board is required whenever board is being installed before the building is enclosed and conditioned.
- 3. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
- 4. Thickness:
  - a. Vertical Surfaces: 5/8 inch.
  - b. Ceilings: 5/8 inch.
- C. Backing Board For Wet Areas:
  - 1. Application: Surfaces behind all walls scheduled to receive tile.
  - 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
  - 3. Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.
    - a. Fire-Resistance-Rated Type: Type X core, thickness 5/8 inch.
    - b. Products:
      - 1) Georgia-Pacific Gypsum; DensShield Tile Backer: [www.gpgypsum.com/#sle](http://www.gpgypsum.com/#sle).
      - 2) Substitutions: See Section 01 6000 - Product Requirements.
- D. Backing Board For Non-Wet Areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.
  - 1. Application: Vertical surfaces behind thinset tile, except in wet areas.
  - 2. Edges: Tapered.
- E. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
  - 1. Application: Ceilings, unless otherwise indicated.
  - 2. Thickness: 5/8 inch.
  - 3. Edges: Tapered.

#### **2.04 GYPSUM BOARD ACCESSORIES**

- A. Acoustic Insulation: ASTM C665; preformed mineral-fiber, friction fit type, unfaced; thickness as required for STC.
- B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
- C. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.
  - 1. Corner Beads: Low profile, for 90 degree outside corners.
    - a. Products:
      - 1) ClarkDietrich; Strait-Flex OS-300: [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).
      - 2) Phillips Manufacturing Co; gripSTIK Vinyl Corner Bead: [www.phillipsmfg.com/#sle](http://www.phillipsmfg.com/#sle).
      - 3) Substitutions: See Section 01 6000 - Product Requirements.
  - 2. L-Trim with Tear-Away Strip: Sized to fit 5/8-inch thick gypsum wallboard.
    - a. Products:
      - 1) ClarkDietrich; Rip-Bead L-Bead: [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).
      - 2) Phillips Manufacturing Co; gripSTIK L-Tear: [www.phillipsmfg.com/#sle](http://www.phillipsmfg.com/#sle).
      - 3) Substitutions: See Section 01 6000 - Product Requirements.
  - 3. Expansion Joints:
    - a. Type: V-shaped metal with factory-installed protective tape.
    - b. Products:
      - 1) ClarkDietrich; 093 Zinc Control Joint: [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).
      - 2) Phillips Manufacturing Co; 093 Expansion Control Joint: [www.phillipsmfg.com/#sle](http://www.phillipsmfg.com/#sle).
      - 3) Substitutions: See Section 01 6000 - Product Requirements.

- D. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
  - 1. Joint Compound: Drying type, vinyl-based, ready-mixed.
- E. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.
- F. Wall/Deck Closures: for above non fire-rated drywall partitions where they join to metal roof deck. Match profile to roof deck. Color shall be GRAY.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that project conditions are appropriate for work of this section to commence.

#### **3.02 SHAFT WALL INSTALLATION**

- A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.
  - 1. Fasten runners to structure with short leg to finished side, using appropriate power-driven fasteners at not more than 24 inches on center.
  - 2. Install studs at spacing required to meet performance requirements.
- B. Shaft Wall Liner: Cut panels to accurate dimensions and install sequentially between special friction studs.

#### **3.03 FRAMING INSTALLATION**

- A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
- B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
  - 1. Level ceiling and soffit system to a tolerance of 1/1200.
  - 2. Laterally brace entire suspension system.
  - 3. Install bracing as required at exterior locations to resist wind uplift.
- C. Studs: Space studs as indicated or as permitted by standards, whichever is more stringent.
  - 1. Extend partition framing to structure in all locations.
  - 2. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.
- D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
- E. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
- F. Resilient Sound Isolation Clips: Install resilient sound isolation clips, and where applicable, associated furring sections and channels, in accordance with clip manufacturer's written instructions.

#### **3.04 ACOUSTIC ACCESSORIES INSTALLATION**

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
  - 1. Place one bead continuously on substrate before installation of perimeter framing members.
  - 2. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

#### **3.05 BOARD INSTALLATION**

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

- B. Single-Layer Nonrated: Install gypsum board perpendicular to framing, with ends and edges occurring over firm bearing.
- C. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
- D. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.
- E. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of nonrated double-layer assemblies, which may be installed by means of adhesive lamination.

### **3.06 INSTALLATION OF TRIM AND ACCESSORIES**

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated on drawings.
  - 1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
  - 2. At exterior openings, vertical from each corner.
  - 3. Verify locations with Architect.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

### **3.07 JOINT TREATMENT**

- A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, embed and finish with setting type joint compound.
- B. Paper Faced Gypsum Board: Use paper joint tape, embed with drying type joint compound and finish with drying type joint compound.
- C. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
  - 1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
  - 2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
  - 3. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
  - 4. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.
  - 5. Level 0: Temporary partitions.
- D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
  - 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
- E. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.
- F. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

### **3.08 TOLERANCES**

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

### **3.09 PROTECTION**

- A. Protect installed gypsum board assemblies from subsequent construction operations.

**END OF SECTION**

**SECTION 09 3000  
TILING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Tile for floor applications.
- B. Tile for wall applications.
- C. Cementitious backer board as tile substrate.
- D. Non-ceramic trim.
- E. Sealant at tile to tile interior corners.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 9200 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.
- B. Section 09 2116 - Gypsum Board Assemblies: Tile backer board.

**1.03 REFERENCE STANDARDS**

- A. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2023.
- A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2024.
- B. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2021.
- C. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2023.
- D. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation; 2019.
- E. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2023.
- F. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2023.
- G. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2014 (Reaffirmed 2024).
- H. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2022.
- I. ANSI A137.3/A108.19/A108.20 - American National Standard Specifications for Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs (Material and Installation Standards); 2025.
- J. TCNA (HB-GP) - Handbook for Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs Installation; 2025-2026.
- K. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2025.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

- C. Samples: Provide one, full size sample of each size and color. Provide multiple samples if necessary to show color and/or texture variations.
- D. Installer's qualification statement.
- E. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.
  - 2. Extra Tile: 2 percent of each size, color, and surface finish combination, but not less than 1 box of each type.

### **1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.
- B. Installer Qualifications: Company specializing in performing tile installation, with minimum of five years of documented experience.
- C. Documents on Site: Maintain one copy of ANSI A108/A118/A136, TCNA (HB), ANSI A137.3/A108.19/A108.20, and TCNA (HB-GP) on site.

### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. See Section 01 7419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

### **1.08 FIELD CONDITIONS**

- A. Do not install solvent-based products in an unventilated environment.
- B. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

## **PART 2 PRODUCTS**

### **2.01 TILE**

- A. Ceramic and Porcelain Tile: ANSI A137.1 standard grade.
  - 1. TL-1:
    - a. Manufacturer: Stonepeak, as provided by Ceramic Tile Works.
    - b. Style and Size: Klastos, 12"x24".
    - c. Color and Finish: Light Gray.
    - d. Install: Vertical Stack.
    - e. Grout: To be selected by Architect from manufacturer's full range.
  - 2. TL-2:
    - a. Manufacturer: Daltile.
    - b. Style and Size: Volume 1.0, 12" x 12".
    - c. Color and Finish: Sonic White.
    - d. Install: Vertical Stack.
    - e. Grout: To be selected by Architect from manufacturer's full range.
  - 3. TL-3:
    - a. Manufacturer: Daltile.
    - b. Style and Size: Volume 1.0, 12" x 12".
    - c. Color and Finish: Waterfall.
    - d. Install: Vertical Stack.
    - e. Grout: To be selected by Architect from manufacturer's full range.

### **2.02 TRIM AND ACCESSORIES**

- A. Non-Ceramic Trim: Finishes as noted below, style and dimensions to suit application, set with tile mortar or adhesive.

1. Applications:
  - a. Open edges of wall and floor tile.
  - b. Outside wall corners.
  - c. Transition between floor finishes of different heights.
  - d. Thresholds at door openings.
  - e. Floor and wall expansion and control joints.
  - f. Floor-to-wall joints.
  - g. Borders and other trim as indicated on drawings.
2. Products:
  - a. SL-1:
    - 1) Manufacturer: Schluter.
    - 2) Style: Jolly.
    - 3) Finish: Satin Anodized Aluminum.
    - 4) Location: At wall tile outside corners and edges.
    - 5) Notes: Include all trim accessories. Contractor to determine size required and submit for architectural approval.
  - b. SL-2:
    - 1) Manufacturer: Schluter.
    - 2) Style: Dilex-AHK.
    - 3) Finish: Satin Anodized Aluminum.
    - 4) Location: At coved floor to wall tile transitions.
    - 5) Notes: Include all trim accessories. Contractor to determine size required and submit for architectural approval.

### **2.03 SETTING MATERIALS**

- A. Manufacturers:
  1. ARDEX Engineered Cements: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
  2. LATICRETE International, Inc: [www.laticrete.com/#sle](http://www.laticrete.com/#sle).
  3. TEC, an H.B.Fuller Construction Products Brand: [www.tecspecialty.com/#sle](http://www.tecspecialty.com/#sle).
  4. Bostik Inc: [www.bostik-us.com/#sle](http://www.bostik-us.com/#sle).
  5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.
- C. Mortar Bed Materials: Pre-packaged mix of Portland cement, sand, latex additive, and water.

### **2.04 GROUTS**

- A. Provide setting and grout materials from same manufacturer.
- B. Manufacturers:
  1. ARDEX Engineered Cements: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
  2. LATICRETE International, Inc: [www.laticrete.com/#sle](http://www.laticrete.com/#sle).
  3. TEC, an H.B.Fuller Construction Products Brand: [www.tecspecialty.com/#sle](http://www.tecspecialty.com/#sle).
  4. Bostik Inc: [www.bostik-us.com/#sle](http://www.bostik-us.com/#sle).
  5. Substitutions: See Section 01 6000 - Product Requirements.
- C. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
  1. Applications: Install in all toilet rooms.
  2. Color: As selected by Architect from manufacturer's full line.
  3. Products:
    - a. LATICRETE International, Inc; LATICRETE SPECTRALOCK PRO Premium Grout: [www.laticrete.com/#sle](http://www.laticrete.com/#sle).
    - b. Substitutions: See Section 01 6000 - Product Requirements.

### **2.05 ACCESSORY MATERIALS**

- A. Waterproofing Membrane at Floors: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.

1. Application: Install only at locations as indicated on drawings and/or required by TCNA standards.
2. Crack Resistance: No failure at 1/16-inch gap, minimum; comply with ANSI A118.12.
3. Fluid or Trowel Applied Type:
  - a. Material: Synthetic rubber.
  - b. Thickness: 25 mils, minimum, dry film thickness.
  - c. Products:
    - 1) LATICRETE International, Inc; LATICRETE HYDRO BAN:  
www.laticrete.com/#sle.
    - 2) Substitutions: See Section 01 6000 - Product Requirements.
  - d. Apply to floor and extend 6 inches vertically (minimum) up wall surface.
- B. Backer Board: Cementitious type complying with ANSI A118.9; high density, glass fiber reinforced, 7/16 inch thick; 2-inch wide coated glass fiber tape for joints and corners.
- C. Sealant:
  1. Application: Install at tile to tile interior corners.
  2. Material: 100% silicone.
  3. Color: Match adjacent grout selection.
  4. Products:
    - a. LATICRETE International, Inc: LATASIL Silicone Sealant; www.laticrete.com/#sle.
    - b. Substitutions: See Section 01 6000 - Product Requirements.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive tile.
- B. Verify wall surfaces are smooth and flat within tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.
- D. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).
  1. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.
- E. Verify that required floor-mounted utilities are in correct location.

### **3.02 PREPARATION**

- A. Vacuum clean surfaces and damp clean.
- B. Seal substrate surface cracks with filler.
- C. Install cementitious backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to feather edge.
- D. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

### **3.03 INSTALLATION - GENERAL**

- A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108/A118/A136, manufacturer's instructions, and TCNA (HB) or TCNA (HB-GP) recommendations, as applicable.
- B. Lay tile to pattern indicated on drawings. Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- E. Form internal angles square and external angles bullnosed.
- F. Install non-ceramic trim in accordance with manufacturer's instructions.
- G. Sound tile after setting. Replace hollow sounding units.
- H. Keep control and expansion joints free of mortar, grout, and adhesive.
- I. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- J. Grout tile joints unless otherwise indicated on drawings. Use standard grout unless otherwise indicated on drawings.
- K. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

### **3.04 INSTALLATION - FLOORS - THIN-SET METHODS**

- A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, on ground, with standard grout, unless otherwise indicated on drawings.
  - 1. Where waterproofing membrane is indicated on drawings, install in accordance with TCNA (HB) Method F122, with latex-Portland cement grout, on ground.
  - 2. Where epoxy bond coat and grout are indicated on drawings, install in accordance with TCNA (HB) Method F131.
  - 3. Where epoxy or furan grout is indicated on drawings, but not epoxy or furan bond coat, install in accordance with TCNA (HB) Method F115.
- B. Install tile-to-tile floor movement joints in accordance with TCNA (HB) Method EJ171F.

### **3.05 INSTALLATION - WALL TILE**

- A. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244C, using membrane at toilet rooms.
- B. Over gypsum wallboard on wood or metal studs, install in accordance with TCNA (HB) Method W243, thin-set with dry-set or latex-Portland cement bond coat.

### **3.06 CLEANING**

- A. Clean tile and grout surfaces.

### **3.07 PROTECTION**

- A. Do not permit traffic over finished floor surface for 4 days after installation.

**END OF SECTION**

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**SECTION 09 5100  
ACOUSTICAL CEILINGS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Suspended metal grid ceiling system and coordinating trim.
- B. Acoustical ceiling tiles.

**1.02 REFERENCE STANDARDS**

- A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025.
- B. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.
- C. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2019 (Reapproved 2025).
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- E. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2024a.
- F. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.
- G. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.

**1.03 ADMINISTRATIVE REQUIREMENTS**

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Do not install acoustical units until after interior wet work is dry.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on suspension system components and acoustical units.
- C. Samples: Submit one sample 6 by 6 inch in size illustrating material and finish of acoustical units.
- D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.
  - 2. Extra Acoustical Units: Up to 5% of each type, with a minimum of 3 boxes and a maximum of 8 boxes.

**1.05 QUALITY ASSURANCE**

- A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

**1.06 FIELD CONDITIONS**

- A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Acoustic Tiles/Panels:
  - 1. Armstrong World Industries, Inc: [www.armstrongceilings.com/#sle](http://www.armstrongceilings.com/#sle).
  - 2. Certainteed Architectural: [www.certainteed.com/ceilings-and-walls/#sle](http://www.certainteed.com/ceilings-and-walls/#sle).
  - 3. USG Corporation: [www.usg.com/#sle](http://www.usg.com/#sle).
  - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Suspension Systems:
  - 1. Same as for acoustical units.
  - 2. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 ACOUSTICAL UNITS**

- A. Acoustical Units - General: ASTM E1264, Class A.
- B. Acoustical Tiles, Type (ACT-1): Painted mineral fiber, with the following characteristics:
  - 1. Basis of Design: Ultima Tegular, as manufactured by Armstrong World Industries Inc, or approved equal.
  - 2. Classification: ASTM E1264 Type A.
  - 3. Size: 24 by 24 inches.
  - 4. Thickness: 3/4 inch.
  - 5. Noise Reduction Coefficient (NRC) Range: .75 to .90, in accordance with ASTM E1264.
  - 6. Ceiling Attenuation Class (CAC) Rating: .40 minimum, in accordance with ASTM E
  - 7. Tile Edge: Beveled Tegular 15/16".
  - 8. Color: White.

### **2.03 SUSPENSION SYSTEMS**

- A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold-down clips, stabilizer bars, clips, and splices as required.
  - 1. Materials:
    - a. Steel Grid: ASTM A653/A653M, G30 coating, unless otherwise indicated.
- B. Exposed Suspension System: Hot-dip galvanized steel grid and cap.
  - 1. Basis of Design: Prelude XL 15/16" Exposed Tee, as manufactured by Armstrong World Industries Inc, or approved equal.
  - 2. Structural Classification: Intermediate-duty, when tested in accordance with ASTM C635/C635M.
  - 3. Profile: Tee; 15/16 inch face width.
  - 4. Color: White.

### **2.04 ACCESSORIES**

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
- B. Hanger Wire: 12 gauge, 0.08 inch galvanized steel wire.
- C. Hold-Down Clips: Manufacturer's standard clips to suit application.
- D. Perimeter Moldings: Same metal and finish as grid.
  - 1. Size: As required for installation conditions and specified Seismic Design Category.
  - 2. Angle Molding: L-shaped, for mounting at same elevation as face of grid.
- E. Touch-up Paint: Type and color to match acoustical and grid units.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.

- B. Verify that layout of hangers will not interfere with other work.

### **3.02 PREPARATION**

- A. Install after major above-ceiling work is complete.
- B. Coordinate the location of hangers with other work.

### **3.03 INSTALLATION - SUSPENSION SYSTEM**

- A. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- B. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
  - 1. Use longest practical lengths.
  - 2. Overlap and rivet corners.
- C. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- D. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- E. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- F. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- G. Do not eccentrically load system or induce rotation of runners.

### **3.04 INSTALLATION - ACOUSTICAL UNITS**

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Fit border trim neatly against abutting surfaces.
- D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- E. Cutting Acoustical Units:
  - 1. Make field cut edges of same profile as factory edges.
  - 2. Double cut and field paint exposed reveal edges.
- F. Where round obstructions occur, provide preformed closures to match perimeter molding.
- G. Install hold-down clips on panels within 20 ft of an exterior door.

### **3.05 TOLERANCES**

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

### **3.06 CLEANING**

- A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.
- B. Clean surfaces.
- C. Replace damaged or abraded components.

**END OF SECTION**

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**SECTION 09 6500  
RESILIENT FLOORING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Resilient tile flooring.
- B. Resilient base.
- C. Installation accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied resilient flooring.
- B. Section 09 0561 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

**1.03 REFERENCE STANDARDS**

- A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.
- B. ASTM F1700 - Standard Specification for Solid Vinyl Floor in Modular Format such as Tile(s) or Plank(s); 2025.
- C. ASTM F1861 - Standard Specification for Resilient Wall Base; 2021 (Reapproved 2025).

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Verification Samples: Submit two samples, 6 by 6 inch in size illustrating color and pattern for each resilient flooring product specified.
- D. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of subfloor is acceptable.
- E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.
  - 2. Extra Materials: Quantity equal to 5 percent of total installed of each color and pattern installed, not to exceed 5 boxes.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented experience.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
- B. Store all materials off of the floor in an acclimatized, weather-tight space.
- C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- D. Protect roll materials from damage by storing on end.
- E. Do not double stack pallets.

## 1.07 FIELD CONDITIONS

- A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

## PART 2 PRODUCTS

### 2.01 TILE FLOORING

- A. Luxury Vinyl Tile: Printed film type, with transparent or translucent wear layer. Comply with ASTM F1700, of class corresponding to type specified.
  - 1. LVT-1:
    - a. Manufacturer: Mannington.
    - b. Style: Spacia, Wood in Spring Maple.
    - c. Size: 7 inches by 48 inches.
    - d. Thickness: 2.5 mm.
    - e. Install: Ashlar.

### 2.02 RESILIENT BASE

- A. Resilient Base: ASTM F1861, Type TP, rubber, thermoplastic.
  - 1. Manufacturers:
    - a. Mannington Commercial: [www.manningtoncommercial.com#sle](http://www.manningtoncommercial.com#sle).
    - b. Tarkett Commercial: [www.tarkett.com/#sle](http://www.tarkett.com/#sle).
    - c. Substitutions: See Section 01 6000 - Product Requirements.
  - 2. Style: Straight profile at carpet, coved profile at hard surface.
  - 3. Height: 4 inches.
  - 4. Thickness: 0.125 inch.
  - 5. Finish: Satin.
  - 6. Length: Roll.
  - 7. Color:
    - a. (RB-1): To be selected by Architect from manufacturer's full range.
    - b. (RB-2): To be selected by Architect from manufacturer's full range.

### 2.03 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.
- C. Moldings, Transition and Edge Strips:
  - 1. Carpet to LVT Transitions:
    - a. Manufacturers:
      - 1) Mannington Commercial; Fusion Transition Strip: [www.manningtoncommercial.com#sle](http://www.manningtoncommercial.com#sle).
      - 2) Tarkett Commercial; MetalEdge: [www.tarkett.com/#sle](http://www.tarkett.com/#sle).
- D. Filler for Coved Base: Plastic.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.
- C. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).

1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

D. Verify that required floor-mounted utilities are in correct location.

### **3.02 PREPARATION**

- A. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor filler to achieve smooth, flat, hard surface.
- B. Prohibit traffic until filler is fully cured.
- C. Clean substrate.
- D. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

### **3.03 INSTALLATION - GENERAL**

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install in accordance with manufacturer's written instructions.
- C. Adhesive-Applied Installation:
  1. Spread only enough adhesive to permit installation of materials before initial set.
  2. Fit joints and butt seams tightly.
  3. Set flooring in place, press with heavy roller to attain full adhesion.
- D. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
- E. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
- F. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

### **3.04 INSTALLATION - TILE FLOORING**

- A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.
- B. Lay flooring with joints and seams parallel to building lines to produce symmetrical pattern.

### **3.05 INSTALLATION - RESILIENT BASE**

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Miter internal corners. At external corners, "V" cut back of base strip to 2/3 of its thickness and fold. At exposed ends, use premolded units.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

### **3.06 CLEANING**

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's written instructions.

### **3.07 PROTECTION**

- A. Prohibit traffic on resilient flooring for 48 hours after installation.

**END OF SECTION**

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**SECTION 09 6813  
TILE CARPETING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Carpet tile, fully adhered.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 03 3000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied flooring.
- C. Section 09 0561 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.
- D. Section 09 0561 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

**1.03 REFERENCE STANDARDS**

- A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.
- B. CRI 104 - Standard for Installation of Commercial Carpet; 2018.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- C. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
- D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- E. Operation and Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.
  - 2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed, not to exceed 5 boxes.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.

**1.06 FIELD CONDITIONS**

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.

**PART 2 PRODUCTS**

**2.01 MATERIALS**

- A. Tile Carpeting, Type (CPT-1): Tufted, manufactured in one color dye lot.
  - 1. Manufacturer: Mannington Commercial.
  - 2. Style: Exchange 2, Dispatch in Operator.
  - 3. Tile Size: 24 inches by 24 inches.
  - 4. Install: Quarter Turn.

- B. Tile Carpeting, Type (CPT-2): Tufted, manufactured in one color dye lot.
  - 1. Manufacturer: Mannington Commercial.
  - 2. Style: Exchange 2, Transmit in Dial Tone.
  - 3. Tile Size: 24 inches by 24 inches.
  - 4. Install: Ashlar.
- C. Tile Carpeting, Type (CPT-3): Tufted, manufactured in one color dye lot.
  - 1. Manufacturer: Mannington Commercial.
  - 2. Style: Frixton in Force.
  - 3. Tile Size: 18 inches by 36 inches.
  - 4. Install: Ashlar

## **2.02 ACCESSORIES**

- A. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.
- B. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type.
  - 1. Compatible with materials being adhered; maximum VOC content as specified in Section 01 6116.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
- B. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.
- C. Cementitious Subfloor Surfaces: Verify that substrates are ready for flooring installation by testing for moisture and alkalinity (pH).
  - 1. Test in accordance with Section 09 0561.
  - 2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
- D. Verify that required floor-mounted utilities are in correct location.

### **3.02 PREPARATION**

- A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- B. Remove subfloor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with subfloor filler.
- C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- D. Vacuum clean substrate.

### **3.03 INSTALLATION**

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install carpet tile in accordance with manufacturer's instructions.
- C. Blend carpet from different cartons to ensure minimal variation in color match.
- D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- E. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines.
- F. Locate change of color or pattern between rooms under door centerline.
- G. Trim carpet tile neatly at walls and around interruptions.
- H. Complete installation of edge strips, concealing exposed edges.

### **3.04 CLEANING**

- A. Remove excess adhesive without damage, from floor, base, and wall surfaces.
- B. Clean and vacuum carpet surfaces.

**END OF SECTION**

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**SECTION 09 9123  
INTERIOR PAINTING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
- D. Do Not Paint or Finish the Following Items:
  - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
  - 2. Items indicated to receive other finishes.
  - 3. Items indicated to remain unfinished.
  - 4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
  - 5. Floors, unless specifically indicated.
  - 6. Glass.
  - 7. Concealed pipes, ducts, and conduits.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 5000 - Metal Fabrications: Shop-primed items.

**1.03 REFERENCE STANDARDS**

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; Current Edition.
- B. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020 (Reapproved 2025).
- C. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.
- D. SSPC V2 (PM2) - Systems and Specifications: Steel Structures Painting Manual Volume 2; 2021.
- E. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
- F. SSPC-SP 2 - Hand Tool Cleaning; 2024.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
  - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g., "alkyd enamel").
  - 2. MPI product number (e.g., MPI #47).
  - 3. Cross-reference to specified paint system products to be used in project; include description of each system.
- C. Samples: Submit two paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
  - 1. Where sheen is specified, submit samples in only that sheen.
- D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.
- E. Manufacturer's Instructions: Indicate special surface preparation procedures.

- F. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.
  - 2. Extra Paint and Finish Materials: 1 gal of each color; from the same product run, store where directed.
  - 3. Label each container with color in addition to the manufacturer's label.

### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 3 years experience and approved by manufacturer.

### **1.06 MOCK-UP**

- A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.
- B. Provide panel, 10 feet long by 10 feet wide, illustrating paint color, texture, and finish.
- C. Mock-up may remain as part of the work.

### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

### **1.08 FIELD CONDITIONS**

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Provide lighting level of 80 fc measured mid-height at substrate surface.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.
- B. Paints and Coatings:
  - 1. Benjamin Moore & Co: [www.benjaminmoore.com/#sle](http://www.benjaminmoore.com/#sle).
  - 2. Diamond Vogel Paints: [www.diamondvogel.com/#sle](http://www.diamondvogel.com/#sle).
  - 3. Hirschfield's Paint Manufacturing: [www.hirschfields.com/#sle](http://www.hirschfields.com/#sle).
  - 4. Sherwin-Williams Company: [www.sherwin-williams.com/#sle](http://www.sherwin-williams.com/#sle).
- C. Primer Sealers: Same manufacturer as top coats.
- D. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 PAINTS AND FINISHES - GENERAL**

- A. Paints and Finishes: Ready-mixed, unless intended to be a field-catalyzed paint.

1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
  2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
  3. Supply each paint material in quantity required to complete entire project's work from a single production run.
  4. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- B. Volatile Organic Compound (VOC) Content:
1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
    - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
  2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- C. Flammability: Comply with applicable code for surface burning characteristics.
- D. Colors: As indicated on drawings.
1. Allow for minimum of 6 colors for each system, unless otherwise indicated, without additional cost to Owner.
  2. Extend colors to surface edges; colors may change at any edge as directed by Architect.

### **2.03 PAINT SYSTEMS - INTERIOR**

- A. Paint CI-OP-3L - Concrete/Masonry, Opaque, Latex, 3 Coat:
1. One coat of block filler.
  2. Eggshell: Two coats of latex enamel.
- B. Paint MI-OP-3L - Ferrous Metals, Unprimed, Latex, 3 Coat:
1. One coat of latex primer.
  2. Satin: Two coats of latex enamel.
- C. Paint MI-OP-2L - Ferrous Metals, Primed, Latex, 2 Coat:
1. Touch-up with latex primer.
  2. Satin: Two coats of latex enamel.
- D. Paint GI-OP-3L - Gypsum Board/Plaster, Latex, 3 Coat:
1. One coat of alkyd primer sealer.
  2. Eggshell: Two coats of latex enamel; Walls.
  3. Flat: Two coats of latex enamel; Ceilings.

### **2.04 ACCESSORY MATERIALS**

- A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials.

- D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the following maximums:
  - 1. Gypsum Wallboard: 12 percent.
  - 2. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
  - 3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
  - 4. Concrete Floors and Traffic Surfaces: 8 percent.

### **3.02 PREPARATION**

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Concrete Floors and Traffic Surfaces: Remove contamination, acid etch and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.
- F. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
- G. Insulated Coverings: Remove dirt, grease, and oil from canvas and cotton.
- H. Aluminum: Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
- I. Galvanized Surfaces:
  - 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
  - 2. Prepare surface according to SSPC-SP 2.
- J. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

### **3.03 APPLICATION**

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
- D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- E. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.
- G. Sand wood and metal surfaces lightly between coats to achieve required finish.
- H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

### **3.04 CLEANING**

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

### **3.05 PROTECTION**

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

### **3.06 COLOR SCHEDULE**

- A. P-1/EP-1: Sherwin Williams, City Loft SW7631.
  - 1. Location: Neutral Field; see finish plans.
- B. P-2/EP-2: Sherwin Williams, Ellie Gray SW7650.
  - 1. Location: Hollow Metal Door Frames.
- C. P-3/EP-3: Sherwin Williams, Icelandic, SW6526.
  - 1. Location: Ceiling Accent; see finish plans.
- D. P-4/EP-4: Sherwin Williams, Persimmon SW6339.
  - 1. Location: Wall and Ceiling Accent; see finish plans.
- E. P-5/EP-5: Sherwin Williams, Golden Plumeria SW9019.
  - 1. Location: Ceiling Accent; see finish plans.

**END OF SECTION**

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**SECTION 10 2113.19  
PLASTIC TOILET COMPARTMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Solid plastic toilet compartments.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 5000 - Metal Fabrications: Concealed steel support members.
- B. Section 06 1000 - Rough Carpentry: Blocking and supports.
- C. Section 10 2800 - Toilet, Bath, and Laundry Accessories.

**1.03 REFERENCE STANDARDS**

- A. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- B. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination: Coordinate work with placement of support framing and anchors in walls and ceilings.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on panel construction, hardware, and accessories.
- C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall, floor, and ceiling supports, and door swings.
- D. Samples: 1 sample block, 3 by 3 inches in size, illustrating partition panel finish, color, and sheen.
- E. Manufacturer's Instructions: Indicate special procedures and perimeter conditions requiring special attention.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. See Section 01 7419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Deliver, store, and handle materials and products in accordance with manufacturer's instructions and recommendations and industry standards.
- C. Do not deliver materials or begin installation until building is enclosed, with complete protection from outside weather, and building temperature maintained at minimum of 60 degrees F.
- D. Store products indoors in manufacturer's or fabricator's original containers and packaging, with labels clearly identifying product name and manufacturer. Protect products from damage.

**1.07 FIELD CONDITIONS**

- A. Ambient Conditions: Maintain environmental conditions, such as temperature, humidity, and ventilation, within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Solid Plastic Toilet Compartments:

1. ASI Accurate Partitions; Solid Plastic HDPE Partitions: [www.asi-globalpartitions.com/#sle](http://www.asi-globalpartitions.com/#sle).
2. Scranton Products; Hiny Hiders Partitions: [www.scrantonproducts.com/#sle](http://www.scrantonproducts.com/#sle).
3. Substitutions: Section 01 6000 - Product Requirements.

## 2.02 SOLID PLASTIC TOILET COMPARTMENTS

- A. General Description: Factory-fabricated doors, pilasters, and divider panels made of solid, molded, high-density polyethylene (HDPE); floor-mounted, headrail-braced.
- B. Color: As selected by Architect.
- C. Doors:
  1. Thickness: 1 inch.
  2. Width: 24 inches.
  3. Width for Handicapped Use: 36 inches, outswinging and 34 inch (864 mm), out-swinging at ambulatory stalls.
  4. Height: 55 inches.
- D. Panels:
  1. Thickness: 1 inch.
  2. Height: 55 inches.
  3. Depth: As indicated on drawings.
- E. Pilasters:
  1. Thickness: 1 inch.
  2. Width: As required to fit space; minimum 3 inches.

## 2.03 FABRICATION

- A. Fabricate toilet compartment components to sizes indicated in shop drawings.
- B. Coordinate requirements and provide cutouts for through-partition toilet accessories.
- C. Provide shoes and caps at pilasters and posts to conceal anchorage, supports, and leveling mechanisms.
- D. Provide manufacturer's standard corrosion-resistant supports, leveling mechanisms, anchors, and anchoring assemblies for pilasters and posts.
- E. Floor-Anchored, Overhead-Braced Units: Provide supports, leveling mechanisms, and anchors at pilasters to suit floor conditions.

## 2.04 MATERIALS

- A. High-Density Polyethylene (HDPE):
  1. Composition: Formed from waterproof, nonabsorbent, HDPE resins.
  2. Properties: Mark-resistant, self-lubricating surface.
  3. Material Fire Ratings: ICC (IBC), Class A.

## 2.05 ACCESSORIES

- A. Pilaster Shoes: Stainless steel, satin finish, 3 inches high; concealing floor fastenings.
  1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.
- B. Headrails: Extruded aluminum, anti-grip profile.
  1. Size: Manufacturer's standard size.
- C. Wall and Pilaster Brackets: Stainless steel; manufacturer's standard type for conditions indicated on drawings.
- D. Attachments, Screws, and Bolts: Stainless steel, tamper-proof type.
- E. Hinges: Stainless steel, manufacturer's standard finish.
  1. Pivot hinges, gravity type, adjustable for door-close positioning; two per door.
- F. Door Hardware: Stainless steel, manufacturer's standard finish.
  1. Door Latch: Slide type with exterior emergency access feature.

2. Door Strike and Keeper with Rubber Bumper: Mount on pilaster in alignment with door latch.
  3. Provide door pull for outswinging doors.
- G. Coat Hook: One per compartment, mounted on door.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify dimensions, tolerances, and interfaces with other work.
- B. Verify spacing of and between plumbing fixtures.
- C. Verify location of built-in framing, anchorage, and bracing.
- D. Verify substrate and site conditions for product installation are installed in accordance with manufacturer's written instructions.

#### **3.02 INSTALLATION**

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's written instructions.
- B. Maintain 3/8-to-1/2-inch space between wall and panels and between wall and end pilasters.
- C. Attach panel brackets securely to walls using anchor devices.
- D. Attach panels and pilasters to brackets. Locate headrail joints at pilaster center lines.

#### **3.03 TOLERANCES**

#### **3.04 ADJUSTING**

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
- B. Adjust hinges to position doors in partially open position when unlatched. Return outswinging doors to closed position.
- C. Adjust adjacent components for consistency of line or plane.

**END OF SECTION**

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**SECTION 10 2600  
WALL AND DOOR PROTECTION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Corner guards.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 1000 - Rough Carpentry: Blocking for wall and corner guard anchors.

**1.03 REFERENCE STANDARDS**

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2024.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- D. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2024.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Indicate physical dimensions, features, wall mounting brackets with mounted measurements, and anchorage details.
- C. Samples: Submit samples illustrating component color and finish.
- D. Maintenance Data: Manufacturer's instructions for care and cleaning of each type of product. Include information about both recommended and potentially detrimental cleaning materials and methods.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver wall and door protection items in original, undamaged protective packaging. Label items to designate installation locations.
- B. Protect work from moisture damage.
- C. Do not deliver products to project site until areas for storage and installation are fully enclosed, and interior temperature and humidity are in compliance with manufacturer's recommendations for each type of item.
- D. Store products in either horizontal or vertical position, in compliance with manufacturer's instructions.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Corner Guards:
  - 1. Construction Specialties, Inc: [www.c-sgroup.com/#sle](http://www.c-sgroup.com/#sle).
  - 2. Inpro Corporation: [www.inprocorp.com/#sle](http://www.inprocorp.com/#sle).
  - 3. Koroseal Interior Products: [www.koroseal.com/#sle](http://www.koroseal.com/#sle).
  - 4. Substitutions: See Section 01 6000 - Product Requirements.

**2.02 PRODUCT TYPES**

- A. Corner Guards - Surface Mounted:
  - 1. Basis of Design: Inpro Corp - 160 High Impact Corner Guard.
  - 2. Material: High impact vinyl with full height extruded aluminum retainer.
  - 3. Thickness: 0.075 inch.

4. Performance: Resist lateral impact force of 100 lbs at any point without damage or permanent set.
5. Surface Burning Characteristics: Provide assemblies with flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
6. Width of Wings: 2 inches.
7. Corner: Radiused.
8. Color: As selected from manufacturer's standard colors.
9. Length: One piece, 48 inches. Guard shall start 4 inches above finish floor.
10. Mounting: Countersunk screws through factory-drilled holes.
11. Locations: Refer to finish floor plans.

### **2.03 FABRICATION**

- A. Fabricate components with tight joints, corners and seams.
- B. Pre-drill holes for attachment.
- C. Form end trim closure by capping and finishing smooth.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.
- B. Verify that field measurements are as indicated on drawings.
- C. Verify that substrate surfaces for adhered items are clean and smooth.
- D. Start of installation constitutes acceptance of project conditions.

### **3.02 INSTALLATION**

- A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to supporting construction.
- B. Position corner guard 4 inches above finished floor to 52 inches.

### **3.03 TOLERANCES**

- A. Maximum Variation From Required Height: 1/4 inch.
- B. Maximum Variation From Level or Plane For Visible Length: 1/4 inch.

### **3.04 CLEANING**

- A. Clean wall and door protection items of excess adhesive, dust, dirt, and other contaminants.

**END OF SECTION**

**SECTION 10 2800  
TOILET, BATH, AND LAUNDRY ACCESSORIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Commercial toilet accessories.

**1.02 OWNER FURNISHED ITEMS (INSTALLED BY CONTRACTOR)**

- A. Toilet Paper Dispensers.
- B. Soap Dispensers.
- C. Paper Towel Dispensers.

**1.03 RELATED REQUIREMENTS**

- A. Section 06 1000 - Rough Carpentry: Concealed supports for accessories, including in wall framing and plates.
- B. Section 09 3000 - Tiling: Ceramic washroom accessories.
- C. Section 10 2113.19 - Plastic Toilet Compartments.
- D. Section 22 4000 - Plumbing Fixtures: Under-lavatory pipe and supply covers.

**1.04 REFERENCE STANDARDS**

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2025.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025.
- D. ASTM C1036 - Standard Specification for Flat Glass; 2025.
- E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- F. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

**1.05 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

**1.06 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.
- C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Commercial Toilet, Shower, and Bath Accessories:
  - 1. AJW Architectural Products: [www.ajw.com](http://www.ajw.com).
  - 2. American Specialties, Inc: [www.americanspecialties.com/#sle](http://www.americanspecialties.com/#sle).
  - 3. Bobrick Washroom Equipment Inc.: [www.bobrick.com](http://www.bobrick.com)
  - 4. Bradley Corporation: [www.bradleycorp.com/#sle](http://www.bradleycorp.com/#sle).
  - 5. Georgia-Pacific Professional: [www.gppro.com/#sle](http://www.gppro.com/#sle).
  - 6. Substitutions: Section 01 6000 - Product Requirements.
- B. Provide products of each category type by single manufacturer.

## **2.02 MATERIALS**

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
  - 1. Grind welded joints smooth.
  - 2. Fabricate units made of metal sheet of seamless sheets with flat surfaces.
- B. Stainless Steel Sheet: ASTM A666/A666M, Type 304.
- C. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.
- D. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
- E. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.
- F. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.

## **2.03 FINISHES**

- A. Stainless Steel: Satin finish, unless otherwise noted.
- B. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy baked enamel.
- C. Galvanizing for Items Other than Sheet: Comply with ASTM A123/A123M; galvanize ferrous metal and fastening devices.

## **2.04 COMMERCIAL TOILET ACCESSORIES**

- A. Toilet Paper Dispenser: Owner furnished, contractor installed.
- B. Paper Towel Dispenser: Owner furnished, contractor installed.
- C. Soap Dispenser: Owner furnished, contractor installed.
- D. Mirrors: Stainless steel framed, 1/4 inch thick annealed float glass; ASTM C1036.
  - 1. Basis of Design: 780 Series manufactured by Bradley Corporation, or equal.
  - 2. Annealed Float Glass: Silvering, protective and physical characteristics in compliance with ASTM C1503.
  - 3. Size: 18 inch W x 30 inch H.
  - 4. Frame: 0.05 inch angle shapes, with mitered corners, welded and ground smooth, and tamperproof hanging system; satin finish.
- E. Grab Bars: Stainless steel, peened surface.
  - 1. Standard Duty Grab Bars:
    - a. Basis of Design: Model 812 Grab Bar Series as manufactured by Bradley, or equal.
    - b. Push and Pull Point Load: Minimum 250 lbf.
    - c. Dimensions: 1-1/2 inch outside diameter, minimum 18-gauge, 0.05-inch steel thickness, concealed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
    - d. Finish: Satin.
    - e. Length and Configuration: As indicated on drawings.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.
- C. Verify that field measurements are as indicated on drawings.
- D. See Section 06 1000 for installation of blocking, reinforcing plates, and concealed anchors in walls and ceilings.

### **3.02 PREPARATION**

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

### **3.03 INSTALLATION**

- A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.

### **3.04 PROTECTION**

- A. Protect installed accessories from damage due to subsequent construction operations.

**END OF SECTION**

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## **SECTION 12 3600 COUNTERTOPS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Countertops for architectural cabinet work.
- B. Countertops for manufactured casework.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 06 4100 - Millwork.
- B. Section 22 4000 - Plumbing Fixtures: Sinks.

#### **1.03 REFERENCE STANDARDS**

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- C. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- D. IAPMO Z124 - Plastic Plumbing Fixtures; 2022, with Editorial Revision.
- E. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.
- F. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

#### **1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Specimen warranty.
- C. Shop Drawings: Complete details of materials and installation ; combine with shop drawings of cabinets and casework specified in other sections.
- D. Verification Samples: For each finish product specified, minimum size 4 inches square, representing actual product, color, and patterns.
- E. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

#### **1.05 QUALITY ASSURANCE**

- A. Fabricator Qualifications: Natural Stone Institute (NSI) Accredited Natural Stone Fabricator; [www.naturalstoneinstitute.org/#sle](http://www.naturalstoneinstitute.org/#sle).
- B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

#### **1.07 FIELD CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

## **PART 2 PRODUCTS**

### **2.01 COUNTERTOPS**

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- B. Plastic Laminate Countertops: High-pressure decorative laminate (HPDL) sheet bonded to substrate.
  - 1. Laminate Sheet, Type (LAM-2): NEMA LD 3, Grade HGS, 0.048 inch nominal thickness.
    - a. Basis of Design Product: Formica, Raw Cloth 6124-58, or approved equal.
    - b. Approved Manufacturers:
      - 1) Arborite: [www.arborite.com/#sle](http://www.arborite.com/#sle).
      - 2) Formica Corporation: [www.formica.com/#sle](http://www.formica.com/#sle).
      - 3) Lamin-Art, Inc: [www.laminart.com/#sle](http://www.laminart.com/#sle).
      - 4) Panolam Industries International, Inc: [www.panolam.com/#sle](http://www.panolam.com/#sle).
      - 5) Abet Laminati: [www.abetlaminati.com/#sle](http://www.abetlaminati.com/#sle).
      - 6) Wilsonart: [www.wilsonart.com/#sle](http://www.wilsonart.com/#sle).
      - 7) Substitutions: See Section 01 6000 - Product Requirements.
    - c. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
    - d. Wear Resistance: In addition to specified grade, comply with NEMA LD 3 High Wear Grade requirements for wear resistance.
    - e. Finish: Matte or suede, gloss rating of 5 to 20.
  - 2. Exposed Edge Treatment: PVC edge with T-spline, sized to completely cover edge of panel.
  - 3. Back and End Splashes: Same material, same construction.
  - 4. Fabricate in accordance with manufacturer's standard requirements.
- C. Solid Surfacing Countertops, Type (SSF-1): Solid surfacing sheet or plastic resin casting over continuous substrate.
  - 1. Flat Sheet Thickness: 1/2 inch, minimum.
  - 2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
    - a. Basis of Design Product: Wilsonart, Oatmeal 9101GS, or approved equal.
    - b. Manufacturers:
      - 1) Dupont: [www.corian.com/#sle](http://www.corian.com/#sle).
      - 2) Formica Corporation: [www.formica.com/#sle](http://www.formica.com/#sle).
      - 3) LG Hausys America, Inc: [www.lghausysusa.com/#sle](http://www.lghausysusa.com/#sle).
      - 4) Wilsonart: [www.wilsonart.com/#sle](http://www.wilsonart.com/#sle).
      - 5) Substitutions: See Section 01 6000 - Product Requirements.
    - c. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
    - d. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
  - 3. Other Components Thickness: 1/2 inch, minimum.
  - 4. Exposed Edge Treatment: Built up to minimum 1-1/4 inch thick; square edge.
  - 5. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
  - 6. Fabricate in accordance with manufacturer's standard requirements.

### **2.02 MATERIALS**

- A. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
- B. Joint Sealant: Mildew-resistant silicone sealant, clear.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

### **3.02 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### **3.03 INSTALLATION**

- A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch.
- C. Seal joint between back/end splashes and vertical surfaces.

### **3.04 TOLERANCES**

- A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.
- B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.
- C. Field Joints: 1/8 inch wide, maximum.

### **3.05 CLEANING**

- A. Clean countertops surfaces thoroughly.

### **3.06 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

**END OF SECTION**

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**SECTION 21 0100  
FIRE PROTECTION GENERAL REQUIREMENTS**

**PART 1 GENERAL**

**1.01 APPLICABILITY**

- A. This section applies to and forms a part of each of the sections of Division 21. This section, and each of the sections to which it applies, is subject to the requirements of the Instructions to Bidders, General Conditions, and Special Conditions of these complete specifications.
- B. The work covered by this Division of the Specifications consists of furnishing all labor, supervision, equipment, materials, all incidentals, related items, and appurtenances, and performing all operations necessary to complete the installation of work in strict accordance with these specifications and drawings.
- C. Only such items as are hereinafter specified or indicated on the drawings to be furnished by others, shall be considered to be furnished by others. All other items are to be considered as a part of this Contract and shall be so bid.
- D. The omission of specific reference to any parts necessary to, or reasonably incidental to, a complete installation shall not be construed as releasing the Contractor from furnishing and installing same.
- E. All work shall be finished, tested and ready for operation.

**1.02 DEFINITIONS**

- A. Word "Furnish" where written in Division 21 specifications and drawings shall mean Contractor shall deliver to the site item(s) specified, as well as additional specialized materials and/or accessories necessary for the use and operation of item or items specified.
- B. Word "Install" where written in Division 21 specifications and drawings shall mean Contractor shall set in position, connect (including sub-assemblies furnished), and adjust for use. Contractor shall furnish miscellaneous specialty items such as hangers, valves, unions, piping, sheet metal, etc., as obviously necessary for a complete and operating installation.
- C. Word "Material" where written in Division 21 specifications and drawings shall mean any and all apparatus, equipment, devices, fixtures, components, products, assemblies, items, parts, things, and any other pieces specified or shown or required.
- D. Word "Labor" where written in Division 21 specifications and drawings shall mean any and all physical effort, manpower, time, expertise, tools, equipment, and services to carefully assemble, install and affix all material in a proper, complete and acceptable manner.
- E. Word "Provide" where written in Division 21 specifications and drawings shall mean "Mechanical Contractor shall furnish all labor and material and completely and properly install such material and leave same in acceptable condition and intended acceptable working order".

**1.03 DISCREPANCIES OR OMISSIONS FROM DRAWINGS OR DOCUMENTS**

- A. Notify the Engineer of any discrepancies in, or omissions from the drawings or documents. Neither the Owner nor the Architect will be responsible for any oral instructions or modifications of the specifications or drawings. Written interpretations will be made only by Addenda.
- B. If discrepancies are not reported, the contractor shall bid the greater quantity or better quality (highest dollar value), and appropriate adjustment will be made after contract award.
- C. Discrepancies discovered during construction shall immediately be called to the attention of the Architect/Engineer for clarification.
- D. All minor items necessary for the completion and successful operation of the system, whether or not herein definitely specified or indicated on the drawings, shall be furnished, and installed.

- E. Omission of/or express reference to any material necessary for/or reasonably incidental to complete installation shall not release Contractor from providing such material. Where material is shown on drawings but is not specified or is specified but not shown, such material shall be considered both shown and specified.
- F. Any work not clear to Contractor shall be referred to Engineer for clarification before bid is submitted. If no question is raised prior to opening of bid, Contractor shall be required to provide work in question as directed by Engineer, whose decision is final, without additional charges.
- G. By virtue of submitting a bid, Contractor agrees that he is skilled and experienced in use of and in interpretation of drawings and specifications. Contractor further agrees that he has carefully reviewed all drawings, all specifications, and all addenda, which constitute bid documents for this contract, and finds them free of ambiguities and good and sufficient for bidding and construction purposes.

#### **1.04 DRAWINGS**

- A. The drawings indicate the extent and general layout of the mechanical systems intended for the building. Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings, connections, and accessories which may be required. Furnish offsets, fittings, valves, and accessories as may be required, to produce a complete and operating installation of type shown and specified.
- B. All piping shall be routed so as not to obstruct access to other equipment. Routing indicated on drawings is representative of intended location but shall be field verified. It shall be this contractor's responsibility to coordinate with other trades for accessibility.
- C. Any work or system on the roof not explicitly indicated on the roof plan shall be approved by the engineer prior to installing.
- D. In general, the mechanical equipment drawings are drawn to scale as noted. Obtain dimensions and locations of partitions, walls, etc., from the Architectural drawings wherever possible and do not scale the mechanical drawings. Consult the Architectural drawings for details of construction, location of suspended ceilings, ceiling heights, and other pertinent information. Architect's drawings shall not take precedence over field measurements.
- E. All drawings and specifications shall be considered in bidding. The drawings and specifications are complimentary, and what is called for in either of these shall be as binding as though called for by both. Should any conflict arise between drawings and specifications, such conflict shall be brought to the attention of the Architect.

#### **1.05 SITE INSPECTION**

- A. Before submitting a proposal for the work contemplated in these specifications and accompanying drawings, each bidder shall examine the site and familiarize themselves with all the existing conditions and limitations, including the extent of demolition, cutting, and patching to be done by the Contractor for Mechanical Work. No extras will be allowed because of the Contractor's misunderstanding as to the amount of work involved, or his lack of knowledge of any condition in connection with the work.

#### **1.06 PRIOR APPROVAL REQUESTS**

- A. Where the Bid Documents stipulate a particular Product, substitutions will be considered by the Engineer up to 10 days before receipt of bids.
- B. The submission shall provide complete information, test, etc. relating to quality, performance, suitability, to determine acceptability of such products.
- C. When a request to substitute a Product is made, the Engineer may approve the substitution and will issue an Addendum to known bidders.

- D. Provide Products as specified unless substitutions are submitted in this manner and subsequently accepted.
- E. The cost of any changes of other trades as a result of use of the substitution material or equipment must be borne by the Contractor submitting such material or equipment.

#### **1.07 REVIEW OF MECHANICAL MATERIALS AND EQUIPMENT**

- A. Within thirty (30) days after award of construction contracts, Contractor shall submit for acceptance to the Architect quantity of shop drawings specified for the equipment indicated in these specifications. The shop drawings shall include the equipment manufacturer's name and address, catalog designation or model number, rough-in data & dimensions, performance curves and rated capacities & operational characteristics.
- B. The Contractor shall thoroughly review each item for compliance with these Specifications making any necessary corrections prior to submittal. Each shop drawing set shall be stamped, signed, and dated indicating Contractor review and submitted electronically via PDF file format. The PDF file name shall include the relevant specification section number for reference. If the Contractor fails to properly review shop drawings, the Contractor shall reimburse the Engineer for all additional reviews on a time and material basis.
- C. Provide samples of materials or equipment proposed to be furnished, if requested. Samples shall become the property of the Architect/Engineer and will be returned only when accompanied by a written request to do so.
- D. None of the items listed shall be purchased, delivered to the site, or installed, until the item is reviewed. No substitution will be permitted after review except where such substitution is considered by the Architect to be in the best interest of the Owner.
- E. The Engineer will review all Shop Drawings submitted and will retain a copy for record file.
- F. Approval Stamp: This review is to verify general conformance with the design concept of the Project and substantial compliance with the information provided in the Contract Documents. This review does not in any way relieve the Contractor or their suppliers of their responsibility to provide all materials and equipment as specified, in quantities, quality and dimensions required. Submittals will be reviewed with the following actions:
  - 1. "No Exception Noted" indicates that the Submittal appears to conform to the design concept of the Work and that the Contractor, at his discretion, may proceed with fabrication and/or procurement and installation.
  - 2. "Make Corrections Noted" indicates that the Submittal, after noted corrections are made, appears to conform to the design concept of the Work and that the Contractor, at his discretion, may proceed with fabrication and/or procurement and installation, if the corrections are accepted by the Contractor without any increase in Contract Sum or Time.
  - 3. "Revised and Resubmit" indicates that the noted revisions are such that a corrected copy of the Submittal is required for review to confirm that the noted revisions have been understood and made. The Contractor, at his discretion, may proceed with fabrication and/or procurement and installation after submitting a corrected copy and verifying with the reviewer that the corrected copy is acceptable, if the corrections are accepted by the Contractor without an increase in the Contract Sum or Time.
  - 4. "Rejected" indicates that the Submittal does not appear to conform to the specifications, a resubmission is required, and fabrication or procurement is not authorized.
- G. If the Engineer rejects (Revised and Resubmit or Rejected) the same section two times the engineer shall be compensated for additional reviews. Any subsequent submittal will require the inclusion of a check made out to the engineer in the amount of \$ 500.00. Contractor is responsible for all delays caused by the resubmittal process.
- H. Should the contractor fail to comply with any of the requirements of the preceding sub-paragraphs; then the right is reserved by the Architect to select any or all items in the material

schedule, with that selection to be final and binding upon the contractor. The materials selected or reviewed, as the case may be, by the Architect, shall be used in the work at no additional cost to the Owner.

- I. Connections and equipment clearances are based on the manufacturer scheduled. Any deviations in size, weight, and/or configuration shall be the responsibility of the contractor. Equipment by other approved manufacturers will be acceptable if of a similar type and grade and if of approximately the same general overall dimensions. Quality, construction and performance must be equal to or better than that specified.
- J. When the contractor chooses to furnish any reviewed material or equipment that requires electrical specifications/connections (circuit breaker, conduit, wire, labor, etc.) different than shown and/or scheduled on the drawings, or specified in detail, the contractor shall be responsible for coordinating any necessary changes and shall bear the cost of such changes (including engineering costs).
  - 1. Submit detailed documentation of all required changes, confirmation of coordination with the Electrical Contractor, and an estimated cost breakdown prior to ordering.
- K. All contractor requested changes from the design, including size, weight, configuration, and electrical modifications, must be submitted for review and proof of coordination prior to approval.

#### **1.08 PROPOSAL REQUESTS AND INSTRUCTIONS**

- A. For any proposal request or instruction that requires an adjustment to the Contract Sum, submit an itemized quotation for the change(s) described in the proposed modifications to the Contract Documents. Proposal shall also indicate credits, deducts, and/or offsets for material and labor originally included in contract.
  - 1. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. Breakdown shall include amounts, lengths, quantities, types, sizes, etc. of material.
  - 2. Indicate applicable taxes, O&P, delivery charges, equipment rental, and other incidental charges.
  - 3. Include costs of labor and supervision directly attributable to the change.
  - 4. All sub-contractor pricing shall include the same breakdown as described above.

#### **1.09 WARRANTY**

- A. All equipment and installation shall be provided with a 1-year warranty beginning with substantial completion.
- B. Refer to individual spec sections for specific warranty information that is different than stated above.
- C. Submit warranty with related forms completed in Owner's name and registered with manufacturer.

#### **1.10 MANUALS**

- A. In addition to catalog data and shop drawings submitted for review, this contractor shall furnish Operation and Maintenance Manuals for the mechanical systems. Manuals shall be delivered to the Architect before final observation of the work.
- B. Operation and Maintenance Manuals shall be furnished in PDF electronic format as well as two (2) copies bound in new hard backed 3 ring binders with the title "Operations and Maintenance Manuals" and the project title clearly printed on the front cover and side of binder .
- C. Provide an index at the beginning of the manual for the sections included in the manual.
- D. All sections in hard copy manuals shall be referenced with plastic tabs.

- E. Include at the front of the manual a complete listing of the Architect, Engineer and contractors and sub-contractors used on the project. Listing shall include names, addresses and phone numbers for each.
- F. Manuals shall be arranged in order similar to the specifications. All major pieces of equipment shall be referenced with tabs. At the beginning of each section, the equipment supplier's name, address, and phone number shall be provided.
- G. Data for equipment included in the manuals shall include:
  - 1. Approved shop drawings clearly showing the models, sizes and capacities of equipment used.
  - 2. Operations Manuals detailing step by step procedure to follow putting the equipment into operation.
  - 3. Maintenance Manuals from the manufacturer of each piece of equipment including instructions on installation, maintenance, and lubrication. Manuals shall include parts lists for all replacement parts.
- H. The following items shall also be included in the manuals for the Owners information: Valve Tag list, Certificate of tests performed on Fire Protection System as submitted to insurance company, and Signed owner instruction forms for all items specified as requiring owners instruction.
- I. Operations and Maintenance Manuals shall be submitted to the Engineer for approval prior to delivery to the Architect.

#### **1.11 INSTRUCTION OF OWNER'S EMPLOYEES**

- A. Furnish, without additional expense to the Owner, the services of competent instructors, who will give full instructions in the care, adjustment, and operation of all parts of the mechanical equipment to the Owner's employees who are to have charge of the equipment.
- B. An Operating and Maintenance Manual shall be made available to the Owner's operating personnel during the instruction and left with the Owner upon completion of the instruction.
- C. The number of man hours of instruction furnished for each system shall be as specified in other sections of this specification. Hours of instruction shall be divided up into a minimum of two (2) instruction periods with 75% of time used for an initial instruction and 25% of time used for a follow up instruction, a minimum of four (4) weeks after initial instruction.
- D. "Instruction of Owner's Employees" form at end of section shall be filled out and signed by Contractor and Owner's Representative and three (3) signed copies of form sent to Engineer.
- E. Owner training and instructions:
  - 1. Sprinkler system including but not limited to piping, heads, alarms, etc. shall not be less than two (2) man hours.

#### **1.12 MECHANICAL LIST OF CONSTRUCTION CLOSEOUT DOCUMENTS**

- A. This Contractor and their subcontractors should proceed immediately to fully complete the work as listed in Appendix 'A' at the end of this Section. The Contractor responsible shall initial and date the "Contractor Completed" column after each item as it is complete and forward a copy of the fully completed punch list to the Engineers for their final approval before final punch list inspection. Reply with an N/A where items don't pertain.

#### **1.13 INSTALLATION OF EQUIPMENT**

- A. All equipment shall be installed and connected in accordance with manufacturer's instructions and recommendations unless such instructions are in conflict with these specifications. Auxiliary piping, valves, electrical connections, etc., recommended by the manufacturer or required for proper operation shall be furnished and installed complete.

- B. All equipment shall be installed in such a manner and location as to facilitate accessibility for maintenance and/or replacement.

#### **1.14 RECORD DRAWING**

- A. The contractor shall maintain one set of drawings at the job site used as a master copy. Each change order or other revision, deletion, or addition shall be clearly marked and noted by colored pencil. This copy of plans shall be furnished to the Architect upon completion of the project.
- B. The contractor shall note on the record drawings the elevations and/or inverts of water service where it exits the building foundation.
- C. A complete set of these drawings shall be scanned at a resolution of 600dpi in color and saved in an Adobe PDF portfolio format with index to each sheet by name and burned to a non-volatile media. The electronic copy of the as-built drawings shall be transmitted to the Engineer. After review and approval by the Engineer, the as-built drawings will be turned over to the Owner.

#### **1.15 COOPERATION WITH OTHER TRADES**

- A. Cooperate with other trades so as to avoid interferences. Where required to avoid interferences with other work or to increase the headroom. Carefully check all construction details to assure the proper installation of all work under this specification. Schedule the work such that it will keep pace with the work of other crafts and cause no delay.

#### **1.16 INSPECTION OF SITE**

- A. Before submitting a proposal on the work contemplated in these specifications and accompanying drawings, each bidder shall examine the site and familiarize themselves with all of the existing conditions and limitations. No extras will be allowed because of Contractor's misunderstanding as to the amount of work involved or lack of his knowledge of any condition in connection with the new construction.

#### **1.17 PAVEMENT, CURB AND SIDEWALK REPLACEMENT**

- A. This Contractor shall be responsible for replacement of existing street pavement, curbs, and sidewalks, etc., removed or damaged by them during the course of the work, unless such pavement, curbs, sidewalks are to be constructed under the General Contract. The work shall be done in accordance with local requirements.

#### **1.18 CODES, ORDINANCES, REGULATIONS & STANDARDS**

- A. The entire installation shall be made in accordance with all state and local laws. If, in any instance, the plans and specifications conflict with such laws, the law shall take precedence. This, however, shall not be construed as relieving the contractor from complying with any requirements of the drawings and specifications that may be in excess of the rules and not contrary to the same.
- B. All work shall conform to applicable state and local codes, ordinances, regulations and/or standards.

#### **1.19 PERMITS AND LICENSES**

- A. This contractor shall obtain and pay for all licenses and permits and shall pay for all fees and charges for the connection to outside services and use of property other than the site of the work for storage of materials or other purposes.
- B. Contractor shall coordinate and request all inspections from authority having jurisdiction. The Contractor shall notify the Architect of all such coordinated inspections (date & time) and shall submit certificates of inspection and final approval of the local inspection authority.

## **1.20 TESTS**

- A. Test all equipment installed under these specifications and demonstrate its proper operation to the Engineer.
- B. Do not test or operate equipment for any purpose, until it has been fully lubricated in accordance with the manufacturer's instructions and, if it is a centrifugal pump, until it has been connected to the piping system with sufficient water so that it will not run dry.
- C. All testing shall be completed before final inspection, and test results shall be available during the final inspection.

## **1.21 GUARANTEES**

- A. This contractor shall guarantee all equipment, material, and workmanship for a period of one year from date of final certificate. Any defects in mechanical equipment, workmanship or materials that appear, or cause trouble of any kind within a period of one year from date of final certificate shall be remedied, free of charge. Refer to other sections of these specifications for guarantees in excess of the requirements herein described.

## **1.22 CONSTRUCTION CLOSEOUT DOCUMENTS**

- A. This Contractor and their subcontractors should proceed immediately to fully complete the work as listed at the end of this Section. The Contractor responsible shall initial and date the "Contractor Completed" column after each item as it is complete and forward a copy of the fully completed punch list to the Engineers for their final approval before final punch list inspection. Reply with an NA where items don't pertain.

## **PART 2 PRODUCTS**

### **2.01 NOT USED**

**PART 3 EXECUTION**

**3.01 INSTRUCTION TO OWNER'S EMPLOYEES FORM:**

DATE \_\_\_\_\_

**INSTRUCTION OF OWNER'S EMPLOYEES**

This letter shall certify that the Contractor has furnished the Owner with full instructions in the care and operation of all parts of the mechanical system as specified under Section 21 0100 paragraph entitled "Instruction of Owner's Employees".

Section	Initial Instructions			Follow-up Instructions		
	Hours	Date	Owners Initials	Hours	Date	Owners Initials
Sprinkler System	_____	_____	_____	_____	_____	_____

Contractor \_\_\_\_\_

Owner Representative \_\_\_\_\_

**3.02 LIST OF CONSTRUCTION CLOSEOUT DOCUMENTS:**

<b>SECTION</b>	<b>DOCUMENT</b>	<b>DATE / INITIALS</b>	<b>APPROVED</b>
21 00 00	Record Drawings Fire Protection		
21 00 00	O&M Manuals Fire Protection		
21 00 00	Owners Instruction Fire Protection		
21 00 00	Provide letter/certification from state/city of acceptance		
21 00 00	Provide all equipment labels per specifications		
21 00 00	Provide wall escutcheon on all piping penetrations through all walls and floors		
21 00 00	Clean all mechanical areas of debris and wipe down all fixtures and equipment. Remove extra materials and garbage from site.		
21 00 00	Contractor to ensure that all holes, existing and new have been patched and repaired and all openings remaining around duct and pipe penetrations shall be filled, caulked, and painted to match wall per specifications.		

**END OF SECTION**

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**SECTION 21 0150  
FIRE PROTECTION MATERIALS & METHODS**

**PART 1 GENERAL**

**1.01 APPLICABILITY**

- A. This section covers basic materials and methods and applies to and forms a part of each of the sections of Division 21.
- B. This work shall be in accordance with this and other applicable sections and/or provisions of these specifications and with the applicable drawings.

**1.02 MATERIALS & MANUFACTURERS**

- A. All materials and equipment shall be new, free of defects, installed in accordance with manufacturer's current published recommendations in a neat manner and in accordance with standard practice of the industry.
- B. Certain materials and/or equipment in this specification are specified by manufacturer and catalog numbers. The design was based on the specified equipment and establishes a degree of quality, performance, physical configuration, etc. If the contractor should elect to use equipment other than the equipment used as a basis for design but listed as "acceptable" in the specifications, he shall be responsible for space requirements, configuration, performance, and changes in bases, supports, vibration isolators, structural members, openings in structure and other apparatus that may be affected by its use.

**PART 2 PRODUCTS**

**2.01 NOT USED**

**PART 3 EXECUTION**

**3.01 COORDINATION OF OPENINGS**

- A. This contractor shall coordinate all openings required for new piping, equipment, controls, etc. through any structural slabs, beams, or walls. Contractor shall request a copy of the precast concrete shop drawings and verify locations and sizes of all openings required.
- B. All costs associated with structural field changes or redesigns of the building systems due to lack of field coordination shall be responsibility of this contractor.

**3.02 PROTECTION, DELIVERY AND STORAGE OF MATERIALS**

- A. Make provisions for the delivery and storage of materials and make the required arrangements with other contractors for the introduction into the building of equipment too large to pass through finished openings.
- B. Protect materials and equipment stored on site from weather and moisture by maintaining factory covers and/or suitable weather-proof coverings. For extended outdoor storage, motors shall be removed from equipment and stored separately.
- C. The open ends of all piping shall be covered whenever that system is not being worked on, i.e. end of the workday, completion of a section, etc. Covering shall keep dust, garbage, vermin, and other foreign objects out of the piping when the contractor is not on the jobsite.

**3.03 CUTTING AND REPAIRING**

- A. All holes and penetrations required for the installation of the fire protection equipment shall be by the fire protection contractor. This shall include all piping and any other penetration through the wall, floor, or roof.
- B. Cutting construction shall be done only with the written permission of the Architect. Cutting shall be done carefully and damage to buildings, pipes, wiring, or equipment as a result of cutting for installation shall be repaired by skilled mechanics of the trade involved at no additional charge

to the Owner. This Contractor shall be responsible for all cutting and patching unless such work has been delegated to the General Contractor.

- C. All holes cut into concrete shall be cut by means of power saws or core drills. All unsightly spalls or chips shall be repaired.
- D. All openings remaining around pipe penetrations shall be filled, caulked, and painted to match wall. Code approved fire caulking shall be used for all rated penetrations.

### **3.04 SEALING FLOOR, CEILINGS AND WALL OPENINGS**

- A. Where pipes pass through walls, ceilings, floors, or partitions, (other than those through fire rated walls or chases) the opening in the construction around the pipe shall not exceed ½ inch average clearance on all sides and shall be sealed to prevent the passage of sound and air. Coordinate wall openings to allow insulation thickness to pass through walls if allowed.
- B. The material used to seal space between the wall and the pipe shall be non-combustible caulk type, or wrap type, as conditions require. Provide sheet metal angles or flanges as may be required to contain the stopping material. Use of expanding foam will be allowed if surfaces are cleaned of an excess material and all edges are trimmed smooth. Penetrations through exterior walls shall be sealed weather tight.
- C. Special attention shall be given to penetrations of mechanical room walls. Fill gaps around entire exterior area of the pipes with sound insulation (batt or mineral wool) to within ½" of the wall surface. Use silicone caulking to finish filling the opening smooth with the wall surface or provide sheet metal angles. All sealer shall meet flame spread 25 and smoke developed less than 50.
- D. Where pipes pass through fire-rated walls, ceilings, floors, vertical service shafts walls, or partitions, the opening in the construction around the pipe or duct shall be fire-stopped to prevent the passage of flame and smoke. All assemblies shall be UL or ASTM listed to provide a fire rating equal to that of the construction being penetrated. For the firestop applications that exist for which no UL tested system is available through a manufacturer, an engineering judgment derived from similar UL system designs or other tests shall be submitted from the manufacturer to the local authorities having jurisdiction for their review and approval prior to installation. Individuals installing the firestopping shall be experienced and certified as required by the manufacturer whose product is being applied. Refer to firestopping spec section for more information.
- E. Acceptable manufacturers shall be Hilti, 3M Brand, or a prior approved product.

### **3.05 CLEANING AND PAINTING**

- A. Clear away all debris, surplus materials, etc., resulting from work or operations, leaving the job and equipment furnished under this contract in a clean condition.
- B. All equipment being furnished with finished paint coat shall be examined upon job completion for scratches and other surface damage. All finished surfaces where necessary shall be touched up with touch-up paint of color to match the factory finish.
- C. Paint all exposed bare pipe exterior of the building. Bare pipe shall be painted one coat of No. 7769402 damp-proof red primer as manufactured by Rust-Oleum Corporation, or equal, and one coat of oil paint. Final coat shall be of a color selected by the architect.
- D. Paint all exposed iron and steel work, pipe hangers, pipe stands, uninsulated tanks, supporting steel for equipment and exposed bare pipe in mechanical areas. Iron and steel work and bare pipe shall be painted one coat of No. 4769402 damp-proof red primer as manufactured by Rust-Oleum Corporation, or equal, and one coat of oil paint. Iron and steel work shall be painted black.
- E. Refer to Section 09, Painting for additional requirements.

### **3.06 ASBESTOS FREE BUILDING**

- A. There shall be no products or building materials used as a temporary or permanent element in the construction of this building, which has in its make-up any form of asbestos. The contractors shall be responsible to monitor shop drawings and product literature to verify the make-up of materials to be used in the building and remind material suppliers that their products must be asbestos free.
- B. Notify the Architect immediately of any existing materials which are suspected of containing asbestos. Do not disturb or attempt to remove any asbestos containing material. The Architect will contact the Owner and inform them of the Contractors observations. The Owner will obtain and provide the services of professionals skilled in asbestos removal.

### **3.07 SALVAGE**

- A. All items removed from existing building shall be salvaged in a workmanlike manner.
- B. The handling, storage, and disposition of salvage materials shall be as directed by the Architect. Generally, all salvage material shall remain the property of the Owner. Materials and equipment not wanted by Owner shall be removed from the job site and become the property of the contractor.

**END OF SECTION**

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**SECTION 21 0500  
COMMON WORK RESULTS FOR FIRE SUPPRESSION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Above ground piping.
- B. Escutcheons.
- C. Mechanical couplings.
- D. Pipe hangers and supports.
- E. Pipe sleeves.

**1.02 REFERENCE STANDARDS**

- A. ASME A112.18.1 - Plumbing Supply Fittings; 2024.
- B. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250; 2026.
- C. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2016.
- D. ASME B16.4 - Gray Iron Threaded Fittings: Classes 125 and 250; 2021.
- E. ASME BPVC-IX - Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators - Welding Brazing and Fusing Qualifications; 2019.
- F. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings; 1999, with Editorial Revision (2022).
- G. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2019.
- H. ASTM A536 - Standard Specification for Ductile Iron Castings; 2024.
- I. ASTM C592 - Standard Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type); 2024.
- J. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2013a (Reapproved 2017).
- K. AWWA C606 - Grooved and Shouldered Joints; 2015.
- L. FM (AG) - FM Approval Guide; current edition.
- M. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- N. UL (DIR) - Online Certifications Directory; current listings at [database.ul.com](http://database.ul.com).

**1.03 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Indicate pipe materials used, jointing methods, supports, and floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.
- C. Closeout Documents:
  - 1. Project Record Documents: Record actual locations of components and tag numbering.
  - 2. Operation and Maintenance Data: Include installation instructions and spare parts lists.

**1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

- B. Installer Qualifications: Company specializing in performing work of the type specified in this section.
  - 1. Minimum three years experience.
- C. Conform to FM (AG) and UL (DIR) requirements.
- D. Valves: Bear FM (AG) and UL (DIR) product listing label or marking. Provide manufacturer's name and pressure rating marked on valve body.
- E. Products Requiring Electrical Connection: Listed and classified as suitable for the purpose specified and indicated.
- F. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver and store valves in shipping containers, with labeling in place.
- B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

## **PART 2 PRODUCTS**

### **2.01 GENERAL REQUIREMENTS**

- A. Sprinkler-based System:
  - 1. Comply with NFPA 13.
  - 2. See Section 21 1300.
- B. Welding Materials and Procedures: Comply with ASME BPVC-IX.
- C. Provide system pipes, fittings, sleeves, escutcheons, seals, and other related accessories.

### **2.02 ABOVE GROUND PIPING**

- A. Steel Pipe: ASTM A53, black.
  - 1. Pipe:
    - a. 2" and smaller: Schedule 40
    - b. 2-1/2" and larger: Schedule 10 where allowed by owner and AHJ
  - 2. Steel Fittings: ASTM A234/A234M wrought carbon steel or alloy steel.
  - 3. Cast Iron Fittings: ASME B16.1, flanges and flanged fittings and ASME B16.4, threaded fittings.
  - 4. Malleable Iron Fittings: ASME B16.3, threaded fittings and ASTM A47/A47M.
  - 5. Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe.

### **2.03 PIPE SLEEVES**

- A. Vertical Piping:
  - 1. Sleeve Length: 1 inch above finished floor.
  - 2. Provide sealant for watertight joint.
  - 3. Blocked Out Floor Openings: Provide 1-1/2 inch angle set in silicon adhesive around opening.
  - 4. Drilled Penetrations: Provide 1-1/2 inch angle ring or square set in silicone adhesive around penetration.
- B. Pipe Passing Through Below Grade Exterior Walls:
  - 1. Zinc-coated or cast-iron pipe.
  - 2. Provide watertight space with link rubber or modular seal between sleeve and pipe on both pipe ends.

- C. Pipe Passing Through Mechanical, Laundry, and Animal Room Floors above Basement:
  - 1. Galvanized steel pipe or black iron pipe with asphalt coating.
  - 2. Connect sleeve with floor plate except in mechanical rooms.

#### **2.04 ESCUTCHEONS**

- A. Manufacturers:
  - 1. Fire Protection Products, Inc: [www.fppi.com.com](http://www.fppi.com.com).
  - 2. Tyco Fire Protection Products: [www.tyco-fire.com](http://www.tyco-fire.com).
  - 3. Viking Group Inc: [www.vikinggroupinc.com](http://www.vikinggroupinc.com).
  - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Material:
  - 1. Fabricate from nonferrous metal.
  - 2. Chrome-plated.
  - 3. Metals and Finish: Comply with ASME A112.18.1.
- C. Construction:
  - 1. One-piece for mounting on chrome-plated tubing or pipe and one-piece or split-pattern type elsewhere.
  - 2. Internal spring tension devices or setscrews to maintain a fixed position against a surface.

#### **2.05 PIPE HANGERS AND SUPPORTS**

- A. Hangers for Pipe Sizes 1/2 to 8 inch: Carbon steel, adjustable swivel.
- B. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- C. Wall Support for Pipe Sizes to 2-1/2 inches and Over: Welded steel bracket with wrought steel clamp.
- D. Vertical Support: Steel riser clamp.
- E. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

#### **2.06 MECHANICAL COUPLINGS**

- A. Manufacturers:
  - 1. Tyco Fire Protection Products: [www.tyco-fire.com/#sle](http://www.tyco-fire.com/#sle).
  - 2. Victaulic Company: [www.victaulic.com/#sle](http://www.victaulic.com/#sle).
  - 3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Rigid Mechanical Couplings for Grooved Joints:
  - 1. Dimensions and Testing: Comply with AWWA C606.
  - 2. Minimum Working Pressure: 300 psig.
  - 3. Housing Material: Fabricate of ductile iron complying with ASTM A536.
  - 4. Housing Coating: Factory applied orange enamel.
  - 5. Gasket Material: EPDM suitable for operating temperature range from minus 30 degrees F to 230 degrees F.
  - 6. Bolts and Nuts: Hot-dipped-galvanized or zinc-electroplated steel.

### **PART 3 EXECUTION**

#### **3.01 PREPARATION**

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and foreign material, from inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

### 3.02 INSTALLATION

- A. Install sprinkler system and service main piping, hangers, and supports in accordance with NFPA 13.
- B. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- C. Install piping to conserve building space, to not interfere with use of space and other work.
- D. Group piping whenever practical at common elevations.
- E. Seal exterior wall penetrations above grade weather tight.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- G. Pipe Hangers and Supports:
  - 1. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
  - 2. Place hangers within 12 inches of each horizontal elbow.
  - 3. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
  - 4. Coordinate anchor locations with structural. In general, support from top, load bearing portion of structural member.
  - 5. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
  - 6. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
  - 7. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
- H. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
- I. 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.
- J. Structural Considerations:
  - 1. Do not penetrate building structural members unless indicated.
- K. Provide sleeves when penetrating floors, walls, and partitions. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.
  - 1. Aboveground Piping:
    - a. Pack solid using mineral fiber complying with ASTM C592.
    - b. Fill space with an elastomer caulk to a depth of 0.50 inch where penetrations occur between conditioned and unconditioned spaces.
  - 2. All Rated Openings: Caulk tight with firestopping material complying with ASTM E814 in accordance with Section 07 8400 to prevent the spread of fire, smoke, and gases.
  - 3. Caulk exterior wall sleeves watertight with lead and oakum or mechanically expandable chloroprene inserts with mastic-sealed components.
- L. Escutcheons:
  - 1. Install and firmly attach escutcheons at piping penetrations into finished spaces.
  - 2. Provide escutcheons on both sides of partitions separating finished areas through which piping passes.
  - 3. Attach plates at the underside only of suspended ceilings.
  - 4. Use chrome plated escutcheons in occupied spaces and to conceal openings in construction.

- M. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, unions, and couplings for servicing are consistently provided.
- N. Die-cut threaded joints with full-cut, standard taper pipe threads with red lead and linseed oil or other non-toxic joint compound applied to male threads only.

**3.03 CLEANING**

- A. Upon completion of work, clean all parts of the installation.
- B. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

**END OF SECTION**

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**SECTION 21 0523**  
**GENERAL-DUTY VALVES FOR WATER-BASED FIRE-SUPPRESSION PIPING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Two-piece ball valves with indicators.
- B. Check valves.
- C. Bronze OS&Y gate valves.
- D. Iron OS&Y gate valves.
- E. Trim and drain valves.

**1.02 ABBREVIATIONS AND ACRONYMS**

- A. NRS: Non-rising stem.
- B. OS&Y: Outside screw and yoke.
- C. PTFE: Polytetrafluoroethylene.

**1.03 REFERENCE STANDARDS**

- A. ASME B1.20.1 - Pipe Threads, General Purpose, Inch; 2013 (Reaffirmed 2018).
- B. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250; 2026.
- C. ASME B31.9 - Building Services Piping; 2020.
- D. ASME BPVC-IX - Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators - Welding Brazing and Fusing Qualifications; 2019.
- E. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service; 2023.
- F. AWWA C606 - Grooved and Shouldered Joints; 2015.
- G. FM (AG) - FM Approval Guide; current edition.
- H. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- I. NFPA 13R - Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies; 2025.
- J. UL (DIR) - Online Certifications Directory; current listings at [database.ul.com](http://database.ul.com).
- K. UL 262 - Gate Valves for Fire-Protection Service; Current Edition, Including All Revisions.
- L. UL 312 - Check Valves for Fire-Protection Service; Current Edition, Including All Revisions.
- M. UL 1091 - Standard for Butterfly Valves for Fire-Protection Service; Current Edition, Including All Revisions.

**1.04 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Closeout Documents:
  - 1. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
  - 2. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts listings.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications:

1. Obtain valves for each valve type from single manufacturer.
  2. Company must specialize in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Where listed products are specified, provide products listed, classified, and labeled by FM (AG), UL (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for the purpose indicated.
- C. Welding Materials and Procedures: Comply with ASME BPVC-IX.

## **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Prepare valves for shipping as follows:
1. Protect internal parts against rust and corrosion.
  2. Set valves open to minimize exposure of functional surfaces.
- B. Use the following precautions during storage:
1. Maintain valve end protection and protect flanges and specialties from dirt.
    - a. Provide temporary inlet and outlet caps.
    - b. Maintain caps in place until installation.
  2. Store valves in shipping containers and maintain in place until installation.
    - a. Store valves indoors and maintain at higher than ambient dew point temperature.
    - b. If outdoor storage is unavoidable, store valves off the ground in watertight enclosures.
- C. Use the following precautions for handling:
1. Do not use operating handles or stems as lifting or rigging points.

## **PART 2 PRODUCTS**

### **2.01 GENERAL REQUIREMENTS**

- A. ASME Compliance:
1. ASME B16.1 for flanges on iron valves.
  2. ASME B1.20.1 for threads on threaded-end valves.
  3. ASME B31.9 for building services piping valves.
- B. Comply with AWWA C606 for grooved-end connections.
- C. Comply with NFPA 13 and NFPA 13R for valves.
- D. Valve Pressure Ratings: Not less than minimum pressure rating indicated or higher as required.
- E. Valve Sizes: Same as upstream piping unless otherwise indicated.

### **2.02 TWO-PIECE BALL VALVES WITH INDICATORS**

- A. UL 1091, except with ball instead of disc and FM (AG) standard listing for indicating valves (butterfly or ball type), Class Number 1112.
- B. Description:
1. Minimum Pressure Rating: 175 psig.
  2. Body Design: Two piece.
  3. Body Material: Forged brass or bronze.
  4. Port Size: Full or standard.
  5. Seat: PTFE.
  6. Stem: Bronze or stainless steel.
  7. Ball: Chrome-plated brass.
  8. Actuator: Worm gear or traveling nut.

### **2.03 CHECK VALVES**

- A. UL 312 and FM (AG) standard listing for check valves, Class Number 1045.
- B. Minimum Pressure Rating: 175 psig.
- C. Type: Center guided check valve.
- D. Body Material: Cast iron, ductile iron.
- E. Center guided check with elastomeric seal.
- F. Hinge Spring: Stainless steel.
- G. End Connections: Flanged, grooved, or threaded.

### **2.04 BRONZE OS&Y GATE VALVES**

- A. UL 262 and FM (AG) standard listing for fire-service water control valves (OS&Y and NRS-type gate valves).
- B. Minimum Pressure Rating: 175 psig.
- C. Body and Bonnet Material: Bronze or brass.
- D. Wedge: One-piece bronze or brass.
- E. Wedge Seat: Bronze.
- F. Stem: Bronze or brass.
- G. Packing: Non-asbestos PTFE.
- H. Supervisory Switch: External.
- I. End Connections: Threaded.

### **2.05 IRON OS&Y GATE VALVES**

- A. Listed and Body Marked: AWWA C509, FM (AG), and UL 262.
- B. Maximum Working Pressure: 175 psi.
- C. Body and Bonnet Material: Cast or ductile iron.
- D. Wedge: Cast or ductile iron, or bronze with elastomeric coating.
- E. Stem: Brass, bronze, or stainless steel.
- F. Packing: Non-asbestos PTFE.
- G. Supervisory Switch: External.

### **2.06 TRIM AND DRAIN VALVES**

- A. Ball Valves:
  - 1. Description:
    - a. Pressure Rating: 175 psig.
    - b. Body Design: Two piece.
    - c. Body Material: Forged brass or bronze.
    - d. Port Size: Full or standard.
    - e. Seat: PTFE.
    - f. Stem: Bronze or stainless steel.
    - g. Ball: Chrome-plated brass.
    - h. Actuator: Hand-lever.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Confirm valve interior to be free of foreign matter and corrosion.
- B. Remove packing materials.
- C. Examine guides and seats by operating valves from the fully open position to the fully closed position.
- D. Examine valve threads and mating pipe for form and cleanliness.

### **3.02 INSTALLATION**

- A. Comply with specific valve installation requirements and application in the following Sections:
  - 1. Section 21 1300 for application of valves in wet and dry pipe, fire-suppression sprinkler systems.
- B. Install listed fire protection shutoff valves supervised-open, located to control sources of water supply except from fire department connections.
- C. Install check valve in water supply connections and backflow preventer at potable water supply connections.
- D. Valves in horizontal piping installed with stem at or above the pipe center.
- E. Position valves to allow full stem movement.
- F. Install valve tags. Comply with Section 21 0553 requirements for valve tags, schedules, and signs on surfaces concealing valves; and the appropriate NFPA standard applying to the piping system in which valves are installed.

**END OF SECTION**

**SECTION 21 0553  
IDENTIFICATION FOR FIRE SUPPRESSION PIPING AND EQUIPMENT**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Nameplates.
- B. Tags.
- C. Pipe markers.
- D. Ceiling tacks.

**1.02 REFERENCE STANDARDS**

- A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2023.

**1.03 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Closeout Documents:
  - 1. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.
  - 2. Manufacturer's Installation Instructions: Indicate special procedures, and installation instructions.
  - 3. Project Record Documents: Record actual locations of tagged valves.

**PART 2 PRODUCTS**

**2.01 IDENTIFICATION APPLICATIONS**

- A. Control Panels: Nameplates.
- B. Major Control Components: Nameplates.
- C. Piping: Pipe markers.
- D. Valves: Tags and ceiling tacks where above lay-in ceilings.

**2.02 NAMEPLATES**

- A. Manufacturers:
  - 1. Brimar Industries, Inc: [www.pipemarker.com/#sle](http://www.pipemarker.com/#sle).
  - 2. Seton Identification Products, a Tricor Direct Company: [www.seton.com](http://www.seton.com).
  - 3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Description: Laminated three-layer plastic with engraved letters.

**2.03 TAGS**

- A. Manufacturers:
  - 1. Brimar Industries, Inc: [www.pipemarker.com/#sle](http://www.pipemarker.com/#sle).
  - 2. Seton Identification Products, a Tricor Direct Company: [www.seton.com](http://www.seton.com).
  - 3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch diameter.
- C. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.
- D. Valve Tag Chart: Typewritten letter size list in anodized aluminum frame.

## **2.04 PIPE MARKERS**

- A. Manufacturers:
  - 1. Brimar Industries, Inc: [www.pipemarker.com/#sle](http://www.pipemarker.com/#sle).
  - 2. Seton Identification Products, a Tricor Company: [www.seton.com](http://www.seton.com).
  - 3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Color: Comply with ASME A13.1.
- C. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure-sensitive adhesive backing and printed markings. Provide sticker/tape around the circumference of the piping at each end of pipe marker to hold marker in place.

## **2.05 CEILING TACKS**

- A. Description: Steel with 3/4 inch diameter color coded head.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Degrease and clean surfaces to receive adhesive for identification materials.

### **3.02 INSTALLATION**

- A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- B. Install tags with corrosion resistant chain.
- C. Markers shall be applied where pipes pass through walls (both sides of the wall), at each change of direction and on each 20 feet of straight lengths.
  - 1. Identify service, flow direction, and pressure.
  - 2. Install in clear view and align with axis of piping.
- D. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.
- E. Locate ceiling tacks to locate valves above T-bar type panel ceilings. Locate in corner of panel closest to equipment.

**END OF SECTION**

**SECTION 21 0784  
MECHANICAL FIRESTOPPING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Firestopping systems.
- B. Firestopping of all mechanical through and membrane penetrations in fire-resistance rated and smoke-resistant assemblies , whether indicated on drawings or not .

**1.02 REFERENCE STANDARDS**

- A. ASTM E 814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops; 2009.
- B. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- C. FM 4991 - Approval of Firestop Contractors; Factory Mutual Research Corporation; 2001.
- D. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.
- E. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; [www.aqmd.gov](http://www.aqmd.gov).
- F. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

**1.03 SUBMITTALS**

- A. See Division 01 - Administrative Requirements, for submittal procedures.
- B. Closeout Documents:
  - 1. Certificate from authority having jurisdiction indicating approval of materials used.

**1.04 QUALITY ASSURANCE**

- A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
  - 1. Listing in the current-year classification or certification books of UL, FM, or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
  - 2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at [www.icc-es.org](http://www.icc-es.org) will be considered as constituting an acceptable test report.
  - 3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
- B. Installer Qualifications: Company specializing in performing the work of this section and:
  - 1. Approved by Factory Mutual Research under FM Standard 4991, Approval of Firestop Contractors , or meeting any two of the following requirements:.
  - 2. With minimum 3 years documented experience installing work of this type.
  - 3. Able to show at least 5 satisfactorily completed projects of comparable size and type.
  - 4. Licensed by authority having jurisdiction.

**1.05 SCOPE / APPLICATION**

- A. Provide installed firestop protects that limit the spread of fire, heat, smoke, and gasses through otherwise unprotected openings in rated assemblies, including walls, partitions, floors, roof/ceilings, and similar locations. restoring the integrity of the fire rated construction to its original fire rating.
- B. Provide firestop systems listed for the specific combination of fire rated construction, type of penetrating item, annular space requirements, and fire rating, and the following criteria:
  - 1. F-Rating: Equal to or greater than the fire-resistance rating of the assembly in which the firestopping will be installed.
  - 2. T-Rating: In habitable areas where penetrating items are exposed to potential contact with materials on fire side(s) of rated assembly, T-rating must equal its F-rating.

3. L-Rating: L-rating of 1 cfm per linear foot (5.5 cu m/h/m) maximum at ambient temperatures.
4. Wall Penetrations: Systems must be symmetrical, with the same rating from both sides of the wall.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. A/D Fire Protection Systems Inc: [www.adfire.com](http://www.adfire.com).
- B. 3M Fire Protection Products: [www.3m.com/firestop](http://www.3m.com/firestop).
- C. Hilti, Inc: [www.us.hilti.com](http://www.us.hilti.com).
- D. Nelson FireStop Products: [www.nelsonfirestop.com](http://www.nelsonfirestop.com).
- E. RectorSeal: [www.rectorseal.com](http://www.rectorseal.com).
- F. International Protective Coatings Corp.

### **2.02 THROUGH PENETRATION FIRESTOP SYSTEMS**

- A. Firestopping: Any material meeting requirements.
  1. Fire Ratings: Use any system listed by UL or tested in accordance with ASTM E 814 that has F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and that meets all other specified requirements.
  2. Fire Ratings: See Drawings for required systems and ratings.

### **2.03 MATERIALS**

- A. Firestopping Sealants: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
- B. Cast-in-Place Devices: Firestopping device for use prior to a concrete pour. Adjustable height with pull tabs, straight edge design for close placement to walls and adjacent devices.
  1. Fire Resistance: For use in 1, 2, or 3 hour fire rated systems.
- C. One piece metal collar assembly encasing intumescent material for firestopping of pipes and cables through rated walls and floors.
  1. Fire Resistance: For use in 1 or 2 hour fire rated systems.
- D. Plastic Pipe Device: Intumescent device for firestopping of plastic pipe and cables through rated walls and floors.
  1. Configuration: One-piece metal collar, with locking latch and bendable tabs to secure; equipped also for conventional anchoring.
  2. Fire Resistance: For use in 1, 2 or 3 hour fire rated systems.
- E. Elastomeric Silicone Firestopping: Single component silicone elastomeric compound and compatible silicone sealant;
  1. Fire Resistance: For use in 1, 2 or 3 hour fire rated systems.
- F. Foam Firestopping: Single component silicone foam compound;
- G. Fibered Compound Firestopping: Formulated compound mixed with incombustible non-asbestos fibers;
- H. Fiber Firestopping: Mineral fiber insulation used in conjunction with elastomeric surface sealer forming airtight bond to opening;
- I. Firestop Devices - Wrap Type: Mechanical device with incombustible filler and sheet stainless steel jacket, intended to be installed after penetrating item has been installed;
- J. Firestop Devices - Cast-In Type: Sleeve and sealing material, intended to be cast in concrete floor forms or in concrete on metal deck, not requiring any additional materials to achieve penetration seal.
  1. Durability and Longevity: Permanent.

- K. Intumescent Putty: Compound that expands on exposure to surface heat gain.
  - 1. Fire Resistance: For use in 1, 2 or 3 hour fire rated systems.
- L. Reusable Firestopping: Removable intumescent compressible shapes, pillows, or blocks specifically tested in removable configuration;:
- M. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify openings are ready to receive the work of this section.

### **3.02 PREPARATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.
- C. Remove incompatible materials that could adversely affect bond.
- D. Install backing materials to arrest liquid material leakage.
- E. Verify that items penetrating fire rated assemblies are securely attached, including sleeves, supports, hangers, and clips.
- F. Verify that openings and adjacent areas are not obstructed by construction that would interfere with installation of firestopping, including ducts, piping, equipment, and other suspended construction.
- G. Install masking and temporary coverings as required to prevent contamination or defacement of adjacent surfaces due to firestopping installation.

### **3.03 INSTALLATION**

- A. Non-rated assemblies shall be draft stopped.
- B. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- C. Install so that openings are completely filled and material is securely adhered.
- D. Where firestopping surface will be exposed to view, finish to a smooth, uniform surface flush with adjacent surfaces.
- E. After installation is complete, remove combustible forming materials and accessories that are not part of the listed system.
- F. Clean firestop materials off surfaces adjacent to openings as work progresses, using methods and cleaning materials approved in writing by firestop system manufacturer and which will not damage the surfaces being cleaned.
- G. Do not cover firestopping with other construction until approval of authority having jurisdiction has been received.
- H. Do not cover installed firestopping until inspected by authority having jurisdiction.
- I. Install labelling required by code.
- J. Install identification Labels for Through Penetration and Construction Joint Systems: Pressure sensitive self-adhesive vinyl labels, preprinted with the following information:
  - 1. The words "Warning - Through Penetration Firestop System - Do not Disturb. Notify Building Management of Any Damage."
  - 2. Listing agency's system number or designation.
  - 3. System manufacturer's name, address, and phone number.
  - 4. Installer's name, address, and phone number.

5. General contractor's name, address, and phone number (if applicable).
6. Date of installation.

#### **3.04 CLEANING**

- A. Clean firestop materials off surfaces adjacent to openings as work progresses, using methods and cleaning materials approved in writing by firestop system manufacturer and which will not damage the surfaces being cleaned
- B. Clean adjacent surfaces of firestopping materials.

#### **3.05 PROTECTION**

- A. Protect adjacent surfaces from damage by material installation.

**END OF SECTION**

**SECTION 21 1100  
FACILITY FIRE-SUPPRESSION WATER-SERVICE PIPING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Water pipe.
- B. Valves.
- C. Bedding and cover materials.
- D. Accessories.

**1.02 REFERENCE STANDARDS**

- A. ASTM A536 - Standard Specification for Ductile Iron Castings; 2024.
- B. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2017a.
- C. ASTM D3139 - Standard Specification for Joints for Plastic Pressure Pipes using Flexible Elastomeric Seals; 2019 (Reapproved 2025).
- D. AWWA C104/A21.4 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings; 2022.
- E. AWWA C105/A21.5 - Polyethylene Encasement for Ductile-Iron Pipe Systems; 2010.
- F. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; 2023.
- G. AWWA C600 - Installation of Ductile-Iron Mains and Their Appurtenances; 2023.
- H. AWWA C605 - Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings; 2021.
- I. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. through 60 In. (100 mm through 1500 mm); 2022.
- J. AWWA M23 - PVC Pipe—Design and Installation; 2020.
- K. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- L. UL (DIR) - Online Certifications Directory; current listings at [database.ul.com](http://database.ul.com).

**1.03 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Include data on pipe materials, pipe fittings, valves, and accessories.
  - 2. Provide manufacturer's catalog information.
  - 3. Indicate valve data and ratings.
  - 4. Show grooved joint couplings, fittings, valves, and specialties on drawings and product submittals, specifically identified with the manufacturer's style or series designation.
  - 5. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- C. Closeout Documents:
  - 1. Record actual locations of piping mains, valves, connections, fire hydrants, free-standing fire department connections, underground manholes and vaults, valve boxes, thrust restraints, and invert elevations.
  - 2. Maintenance Data: Include installation instructions, spare parts lists, and exploded assembly views.

**1.04 QUALITY ASSURANCE**

- A. Provide grooved joint couplings, fittings, valves, specialties, and grooving tools from a single manufacturer.

- B. Date stamp castings used for coupling housings, fittings, and valve bodies for quality assurance and traceability.
- C. Valves: Bearing product listing label or marking. Provide manufacturer's name and pressure rating marked on valve body.
- D. Products:
  - 1. Listed, classified, and labeled as suitable for the purpose specified and indicated.
  - 2. Refer to UL (DIR).
- E. Perform Work in accordance with local authorities having jurisdiction, municipality, and water utility requirements.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

#### **1.06 FIELD CONDITIONS**

- A. Do not install underground piping when bedding is wet or frozen.

#### **1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.

### **PART 2 PRODUCTS**

#### **2.01 WATER PIPE**

- A. Ductile Iron Pipe: Listed, AWWA C104/A21.4:
  - 1. Fittings: Ductile iron, standard thickness.
  - 2. Joints: AWWA C111/A21.11, styrene-butadiene rubber (SBR) or vulcanized SBR gasket with rods.
  - 3. Jackets: AWWA C105/A21.5 polyethylene jacket.
- B. PVC Pipe: Listed, AWWA C900 Class 100:
  - 1. Fittings: AWWA C111/A21.11, cast iron.
  - 2. Joints: ASTM D3139 compression gasket ring.

#### **2.02 VALVES**

- A. General:
  - 1. Manufacturer's name and pressure rating marked on valve body.
  - 2. Minimum Compliance: UL (DIR) listed and labeled.
  - 3. Maximum Inlet Pressure: 400 psi.
  - 4. Maximum Service Temperature: 180 degrees F.
  - 5. Valve Coatings:
    - a. Internally: 4 mils, 0.004 inch epoxy, minimum.
    - b. Externally: Epoxy base then fire red enamel paint or heat-fused red epoxy paint.
- B. Double Check Detector Valve Assembly, Flanged End:
  - 1. Manufacturers:
    - a. Ames Fire and Waterworks: [www.amesfirewater.com/#sle](http://www.amesfirewater.com/#sle).
    - b. Deringer
    - c. Substitutions: See Section 01 6000 - Product Requirements.
  - 2. 2-1/2 inch NPS to 10 inch NPS:

- a. Construction:
  - 1) Body: 300 Series stainless steel or ASTM A536 Grade 65-45-12 ductile iron.
  - 2) Two independently operating, spring-loaded, check valves.
  - 3) Two OSY resilient seated gate valves.
  - 4) Bypass Assembly:
    - (a) Bypass Line: Hydraulically sized to accurately measure low flow.
    - (b) Double check including shut-off valves, and required cocks.
  - 5) Cam-Check:
    - (a) Internally loaded, providing positive, drip-tight closure against reverse flow.
    - (b) Stainless steel cam arm and spring, rubber-faced disc, and replaceable, thermoplastic seat.
  - 6) Valve Cover:
    - (a) Provides access to all internal parts.
    - (b) Held in place through the use of a single grooved style two-bolt coupling.

### **2.03 BEDDING AND COVER MATERIALS**

- A. Bedding: As specified in Section 31 2316.13.
- B. Cover: As specified in Section 31 2316.13.

### **2.04 ACCESSORIES**

- A. Concrete for Thrust Restraints: Concrete type specified in Section 03 3000.
- B. Supervisory Switches: See Section 21 1300 for waterflow and supervisory switches.
- C. Tracer Wire:
  - 1. Provide magnetic, detectable conductor with clear plastic covering and imprinted with "Water Service" in large letters.
  - 2. Conductor to be of sufficient length to be continuous over each separate run of nonmetallic pipe.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that building service connection and municipal utility water main size, location, and invert are as indicated.

### **3.02 PREPARATION**

- A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare pipe connections to equipment with flanges or unions.

### **3.03 TRENCHING**

- A. Earthwork: Perform earthwork operations in accordance with Sections 31 2316, 31 2316.13, and 31 2323.
- B. Hand trim excavation for accurate placement of pipe to elevations indicated.
- C. Form and place concrete for pipe thrust restraints at each change of pipe direction. Place concrete to permit full access to pipe and pipe accessories. Provide thrust restraint bearing on subsoil.
- D. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

### **3.04 INSTALLATION**

- A. General Requirements:

1. Location of Water Lines:
  - a. Terminate the work covered by this Section at a point approximately 5 feet from the building unless indicated otherwise.
  - b. Do not install water line closer horizontally than 10 feet from any sewer line unless indicated otherwise.
  - c. Water Piping Parallel With Sewer Piping:
    - 1) Install water piping minimum 10 feet horizontally (measured edge-to-edge) from a sewer or sewer manhole where possible.
    - 2) Bottom (Invert) of Water Piping:
      - (a) Minimum 18 inches above top (crown) of sewer piping.
      - (b) Where this vertical separation of 18 inches above top (crown) of sewer piping cannot be obtained, the installation will be acceptable only when sewer piping is constructed of AWWA approved water pipe and pressure tested in place without leakage prior to backfilling.
2. Sleeving:
  - a. Sleeve water piping where piping is required to be installed within 3 feet of existing structures.
  - b. Provide ductile iron or Schedule 40 steel sleeves.
  - c. Fill annular space between pipe and sleeves with mastic.
  - d. Install water pipe and sleeve without damaging structures or causing settlement or movement of foundations or footings.
3. Pipe Laying and Jointing:
  - a. Remove fins and burrs from pipe and fittings.
  - b. Prior to placing in position, clean pipe, fittings, valves, and accessories, and maintain in clean condition.
  - c. Provide proper facilities for lowering pipe sections into trenches.
  - d. Dropping or dumping of piping, fittings, valves, or any other water line material into trenches is not permitted.
  - e. Cut pipe in a neat, workmanlike manner accurately to length established at the site and work into place without forcing or springing.
  - f. Replace by one of the proper length any pipe or fitting that does not allow sufficient space for proper installation of jointing material.
  - g. Wedging or blocking between bells and spigots will not be permitted.
  - h. Install bell-and-spigot pipe with the bell end pointing in the direction of laying.
  - i. Grade the pipeline in straight lines avoiding the formation of dips and low points.
  - j. Support piping at proper elevation and grade.
  - k. Secure firm, uniform support.
  - l. Wood support blocking will not be permitted.
  - m. Install pipe so that the full length of each pipe section and each fitting will rest solidly on the pipe bedding; excavate recesses to accommodate bells, joints, and couplings.
  - n. Provide anchors and supports where indicated and necessary for fastening work into place.
  - o. Provide proper provisions for expansion and contraction of pipelines.
  - p. Keep trenches free of water until joints have been properly made.
  - q. Close open ends of piping temporarily with wood blocks or bulkheads at the end of each workday.
  - r. Do not install pipe during unacceptable trench conditions or inclement weather.
  - s. Minimum Depth of Pipe Cover: Not less than 2-1/2 feet.
4. Tracer Wire:
  - a. Install continuous length of tracer wire for the full length of each run of nonmetallic pipe.

- b. Attach wire to top of pipe securely to prevent displacement during installation.
- 5. Connections to Existing Water Lines:
  - a. Ensure minimal interruption of service on the existing line.
  - b. Make connections to existing lines under pressure in accordance with the recommended procedures of the manufacturer of the pipe being tapped.
- 6. Penetrations:
  - a. Provide ductile-iron or Schedule 40 steel for pipes passing through walls of valve pits and structures.
  - b. Fill annular space between sleeves and walls with rich cement mortar.
  - c. Fill annular space between pipe and sleeves with mastic.
- B. Special Requirements:
  - 1. Ductile Iron Piping:
    - a. Unless otherwise specified, install pipe and fittings in accordance with paragraph "General Requirements".
    - b. Jointing:
      - 1) Make push-on joints with the gaskets and lubricant specified for this type joint; assemble in accordance with the applicable requirements of AWWA C600 for joint assembly.
      - 2) Make mechanical joints with the gaskets, glands, bolts, and nuts specified for this type joint; assemble in accordance with the applicable requirements of AWWA C600 for joint assembly and the recommendations of Appendix A to AWWA C111/A21.11.
      - 3) Make flanged joints with the gaskets, bolts, and nuts specified for this type joint.
        - (a) Make flanged joints up tight; avoid undue strain on flanges, fittings, valves, and other accessories and equipment.
        - (b) Align bolt holes for each flanged joint.
        - (c) Use full size bolts for the bolt holes; use of undersized bolts to make up for misalignment of bolt holes or for any other purpose will not be permitted.
        - (d) Do not allow adjoining flange faces to be out of parallel to such a degree that the flanged joint cannot be made watertight without over-straining the flange.
        - (e) When flanged pipe or fitting has dimensions that do not allow the making of a proper flanged joint as specified, replace it by one of proper dimensions.
        - (f) Use set-screwed flanges to make flanged joints where conditions prevent the use of full length, flanged pipe and assemble in accordance with the recommendations of the set-screwed flange manufacturer.
    - c. Allowable Deflection:
      - 1) Maximum Allowable Deflection: As stated in AWWA C600.
      - 2) If the alignment requires deflection in excess of the above limitations, furnish special blends or a sufficient number of shorter pipe lengths to provide angular deflections within the limit set forth.
    - d. Pipe Anchorage:
      - 1) Provide concrete thrust blocks (reaction backing), for pipe anchorage except where metal harness is indicated.
      - 2) Thrust blocks to comply with the requirements of AWWA C600 for thrust restraint, except that size and positioning of thrust blocks to be as indicated.
      - 3) Use concrete, ASTM C94/C94M, having a minimum compressive strength of 2,500 psi at 28 days; or use concrete of a mix not leaner than one part cement, 2-1/2 parts sand, and 5 parts gravel, having the same minimum compressive strength.

- 4) Provide metal harness in accordance with the requirements of AWWA C600 for thrust restraint, using tie rods and clamps as indicated in NFPA 13, except as otherwise indicated.
  - e. Exterior Protection: Completely encase buried ductile iron pipelines with polyethylene tube or sheet, using Class A polyethylene film, in accordance with AWWA C105/A21.5.
2. PVC Plastic Piping:
- a. Unless otherwise specified, install pipe and fittings in accordance with paragraph "General Requirements"; with the requirements of AWWA C605 for laying of pipe, joining PVC pipe to fittings and accessories, and setting of hydrants, valves, and fittings; and with the recommendations for pipe joint assembly and appurtenance installation in AWWA M23.
  - b. Jointing:
    - 1) Push-On Joints:
      - (a) Make push-on joints with the elastomeric gaskets specified for this type joint, using either elastomeric-gasket bell-end pipe or elastomeric-gasket couplings.
      - (b) For pipe-to-pipe push-on joint connections, use only pipe with push-on joint ends having factory-made bevel.
      - (c) For push-on joint connections to metal fittings, valves, and other accessories, cut spigot end of pipe off square and re-bevel pipe end to a bevel approximately the same as that on ductile-iron pipe used for the same type of joint.
      - (d) Use an approved lubricant recommended by the pipe manufacturer for push-on joints.
      - (e) Assemble push-on joints for pipe-to-pipe joint connections in accordance with the requirements of AWWA C605 for laying the pipe and the recommendations in AWWA M23 for pipe joint assembly.
      - (f) Assemble push-on joints for connection to fittings, valves, and other accessories in accordance with the requirements of AWWA C605 for joining PVC pipe to fittings and accessories and with the applicable requirements of AWWA C600 for joint assembly.
  - c. Offset: Maximum offset in alignment between adjacent pipe joints to be as recommended by the manufacturer and approved by the Engineer, not to exceed 5 degrees.
  - d. Pipe Anchorage:
    - 1) Provide concrete thrust blocks (reaction backing) for pipe anchorage, except where metal harness is indicated.
    - 2) Provide thrust blocks in accordance with the requirements of AWWA C605 for reaction or thrust blocking and plugging of dead ends, except that size and positioning of thrust blocks to be as indicated.
    - 3) Use concrete, ASTM C94/C94M, having a minimum compressive strength of 2,500 psi at 28 days; or use concrete of a mix not leaner than one part cement, 2-1/2 parts sand, and 5 parts gravel, having the same minimum compressive strength.
    - 4) Provide metal harness as indicated.
  - e. Fittings: Install in accordance with AWWA C605.
- C. Valves:
- 1. Set valves on solid bearing.
  - 2. Center and plumb valve box over valve.
  - 3. Set box cover flush with finished grade.

### **3.05 SERVICE CONNECTIONS**

- A. Provide fire water service to Local Authority Having Jurisdiction requirements with reduced pressure backflow preventer and water meter with by-pass valves.
- B. Provide sleeve in retaining wall for service main. Support with reinforced concrete bridge. Caulk enlarged sleeve watertight.
- C. Anchor fire service main to interior surface of foundation wall.
- D. Provide 18 gauge, 0.0478 inch galvanized sheet metal sleeve surrounding service main to 6 inches above floor and 6 feet minimum below grade. Size for 2 inches minimum of glass fiber insulation stuffing.

### **3.06 FIELD QUALITY CONTROL**

- A. Field Tests and Inspections:
  - 1. See Section 01 4000 - Quality Requirements for additional requirements.
  - 2. Provide all labor, equipment, and incidentals required for field testing, except that water and electric power needed for field tests will be furnished as set forth in Section 01 5100 - Temporary Utilities.
  - 3. Conduct piping tests before joints are covered and after concrete thrust blocks have hardened sufficiently and at least 5 days after placing of concrete after concrete thrust blocks have hardened sufficiently and at least 5 days after placing of concrete.
  - 4. Fill pipeline 24 hours before testing and apply test pressure to stabilize system, using only potable water.
  - 5. Pressure test piping to \_\_\_\_ psi.
  - 6. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.
  - 7. Prepare reports of testing activities.

### **3.07 CLOSEOUT ACTIVITIES**

- A. Demonstrate proper operation of equipment to Owner's designated representative.
- B. Training: Train Owner's personnel on operation and maintenance of system.
  - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
  - 2. Provide minimum of two hours of training.

**END OF SECTION**

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**SECTION 21 1300  
FIRE-SUPPRESSION SPRINKLER SYSTEMS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Wet-pipe sprinkler system.
- B. System design, installation, and certification.
- C. Fire department connections.

**1.02 REFERENCE STANDARDS**

- A. FM (AG) - FM Approval Guide; current edition.
- B. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. NFPA 1963 - Standard for Fire Hose Connections; 2019.
- D. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.
- E. UL 405 - Standard for Safety Fire Department Connection Devices; Current Edition, Including All Revisions.

**1.03 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Submit preliminary layout of finished ceiling areas indicating only sprinkler locations coordinated with ceiling installation.
  - 2. Indicate hydraulic calculations, detailed pipe layout, hangers and supports, sprinklers, components, and accessories. Indicate system controls.
  - 3. Submit shop drawings to Authorities Having Jurisdiction for approval. Submit proof of approval to Engineer.
- C. Closeout Documents:
  - 1. Operation and Maintenance Data: Include components of system, servicing requirements, record drawings, inspection data, replacement part numbers and availability, and location and numbers of service depot.
  - 2. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    - a. Extra Sprinklers: Type and size matching those installed in quantity required by referenced NFPA design and installation standard.
    - b. Sprinkler Wrenches: For each sprinkler type.
  - 3. Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations.

**1.04 QUALITY ASSURANCE**

- A. Comply with FM (AG) requirements.
- B. Designer Qualifications: Design of the system including all shop drawings, calculations, and other submittals shall be completed by a technician with a minimum NICET Level III certification or by a registered Professional Engineer who has passed the NCEES professional engineering exam for fire protection and is licensed in the State in which the Project is located.
- C. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- D. Installer Qualifications: Company specializing in performing the work of this section with minimum five years experience and approved by manufacturer.
- E. Equipment and Components: Provide products that bear FM (AG) label or marking.

- F. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.

### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. 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**

### **2.01 MANUFACTURERS**

- A. Sprinklers, Valves, and Equipment:
  - 1. Deringer
  - 2. Tyco Fire Protection Products: [www.tyco-fire.com](http://www.tyco-fire.com).
  - 3. Viking Corporation: [www.vikinggroupinc.com](http://www.vikinggroupinc.com).
  - 4. Victaulic
  - 5. Reliable Automatic Sprinkler Co.
  - 6. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 SPRINKLER SYSTEM**

- A. Sprinkler System: Provide coverage for building areas noted.
- B. Occupancy: Light hazard; comply with NFPA 13.
- C. Water Supply: Determine volume and pressure from water flow test data.
- D. Provide fire department connections where indicated.
- E. Storage Cabinet for Spare Sprinklers and Tools: Steel, located adjacent to alarm valve.

### **2.03 SPRINKLERS**

- A. Suspended Ceiling Type: Concealed pendant type with matching push on escutcheon plate.
  - 1. Response Type: Quick.
  - 2. Coverage Type: Standard.
  - 3. Finish: Chrome plated.
  - 4. Cover Plate Finish: White.
  - 5. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- B. Hard Ceiling Type: Concealed pendant type.
  - 1. Response Type: Quick.
  - 2. Coverage Type: Standard.
  - 3. Finish: Chrome plated.
  - 4. Cover Plate Finish: White.
  - 5. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- C. Exposed Area Type: Pendant type.
  - 1. Response Type: Quick.
  - 2. Coverage Type: Standard.
  - 3. Finish: Brass.
  - 4. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- D. Sidewall Type: Semi-recessed horizontal sidewall type with matching push on escutcheon plate.
  - 1. Response Type: Quick.
  - 2. Coverage Type: Standard.
  - 3. Finish: Chrome plated.
  - 4. Escutcheon Plate Finish: Chrome plated.
  - 5. Fusible Link: Glass bulb type temperature rated for specific area hazard.

- E. Head Guards: Finish to match sprinkler finish. Provide for gymnasiums, hockey rinks, fitness and recreation centers and rack storage areas.
  - 1. Provide head guards in gymnasiums, mechanical rooms, near shelving and other areas subject to damage.
  - 2. Inline SprinkGAURD powder coated steel.
- F. Flexible Drop System: Stainless steel, multiple use, open gate type.
  - 1. Application: Use to properly locate sprinkler heads.
  - 2. Include all supports and bracing.
  - 3. Provide braided type tube as required for the application.
  - 4. Manufacturers:
    - a. Victaulic Company; Vic-Flex: [www.victaulic.com/#sle](http://www.victaulic.com/#sle).
    - b. Substitutions: See Section 01 6000 - Product Requirements.

## 2.04 PIPING SPECIALTIES

- A. Wet Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber-faced clapper to automatically actuate water motor alarm, pressure retard chamber and variable pressure trim with the following additional capabilities and features:
  - 1. Activate electric alarm.
  - 2. Test and drain valve.
  - 3. Replaceable internal components without removing valve from installed position.
- B. Backflow Preventer: Reduced pressure principle valve assembly backflow preventer with drain and OS & Y gate valve on each end.
- C. Test Connections:
  - 1. Backflow Preventer Test Connection:
    - a. Provide downstream of the backflow prevention assembly, listed hose valves with 2.5 inch National Standard male hose threads with cap and chain.
    - b. Furnish one valve for each 250 gpm of system demand or fraction thereof.
    - c. Provide permanent sign reading "Test Valve" in accordance with Section 21 0553.
- D. Electric Alarm: UL listed audible strobe with 3 selectable dBA settings NEMA 4x rated for outdoor installations. Wired to flow and/or pressure switch on sprinkler zone piping. Provide switching relay for multiple zone valve input.
- E. Water Flow Switch: Vane type switch for mounting horizontal or vertical, with two contacts; rated 10 amp at 125 volt AC and 2.5 amp at 24 volt DC.
- F. Fire Department Connections:
  - 1. Type: Flush, wall mount made of corrosion resistant metal complying with UL 405.
    - a. Inlets: Two way, 2-1/2 inch swivel fittings, internal threaded. Thread size and inlets according to NFPA 1963 or Authority Having Jurisdiction. Brass caps with gaskets, chains, and lugs.
    - b. Configuration: Horizontal.
    - c. Outlet: With pipe threads, 4 NPS.
      - 1) Location: Back.
    - d. Finish: Brass or bronze.
    - e. Signage: Raised or engraved lettering 1 inch minimum indicating system type.
    - f. Manufacturers:
      - 1) Elkhart Brass Manufacturing Company, Inc: [www.elkhartbrass.com](http://www.elkhartbrass.com).
      - 2) Substitutions: See Section 01 6000 - Product Requirements.

## PART 3 EXECUTION

### 3.01 INSTALLATION

- A. Install in accordance with referenced NFPA design and installation standard.

- B. Install equipment in accordance with manufacturer's instructions.
- C. Provide approved backflow preventer assembly at sprinkler system water source connection.
- D. Locate fire department connection with sufficient clearance from walls, obstructions, or adjacent siamese connectors to allow full swing of fire department wrench handle.
- E. Place pipe runs to minimize obstruction to other work.
- F. Place piping in concealed spaces above finished ceilings.
- G. Center sprinklers in two directions in ceiling tile and provide piping offsets as required.
- H. Apply masking tape or paper cover to ensure concealed sprinklers, cover plates, and sprinkler escutcheons do not receive field paint finish. Remove after painting. Replace painted sprinklers.
- I. Flush entire piping system of foreign matter.
- J. Install guards on sprinklers where indicated.
- K. Hydrostatically test entire system.
- L. Require test be witnessed by Fire Marshal.

### **3.02 INTERFACE WITH OTHER PRODUCTS**

- A. Ensure required devices are installed and connected as required to fire alarm system.

**END OF SECTION**

**SECTION 22 0060  
PLUMBING & PIPING DEMOLITION**

**PART 1 GENERAL**

**1.01 DESCRIPTION**

- A. Contract documents and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections apply to this section.
- B. This section specifies the demolition and removal of all plumbing equipment and distribution conduits including but not limited to air outlets, piping, insulation, plumbing fixtures and accessories in existing building.
- C. Unless otherwise noted in the Documents, all salvage items removed in connection with this Contract are to become the property of the Contractor, however the Owner shall have the first right of refusal on all equipment removed.

**1.02 SUBMITTALS**

- A. Proposed Dust Control and Noise Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate.
- B. Schedule of selective demolition activities:
  - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
  - 2. Interruption of building utility services.
  - 3. Coordination for shutoff, capping and continuation of services.
  - 4. Coordination of Owner's continued occupancy of portions of existing building and of Owner's occupancy of completed work.
- C. Pre-demolition photographs or videotape showing existing pre-demolition conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by selective demolition operations. Submit before demolition work begins.

**1.03 PROJECT CONDITIONS**

- A. Owner will occupy portions of the building immediately adjacent to selective demolition area. Conduct demolition so Owner's operation will not be disturbed. Provide not less than 48-hour notice to Owner of activities that will affect the Owner's operations.
- B. Maintain existing services to Owner occupied areas during demolition if possible or coordinate interruption of services prior to demolition.
- C. Owner assumes no responsibility for condition of area to be selectively demolished.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
- E. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify the Owner. Hazardous materials will be removed by Owner under a separate contract.

**PART 2 PRODUCTS**

**2.01 MATERIALS AND EQUIPMENT**

- A. Materials and equipment for patching and extending work: As specified in individual Sections.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify field measurements and existing ductwork and piping arrangements are as shown on Drawings.
- B. Verify that abandoned equipment serves only abandoned facilities.
- C. Demolition drawings are based on casual field observation and existing record documents. The demolition Drawings are diagrammatic and show the general scope of demolition work and do not show all the construction detail of the original record drawings. Report discrepancies to the Project Engineer before disturbing existing installation.
- D. The Contractor shall visit the existing building and grounds and review the existing building record drawings for details of existing installation to familiarize themselves with existing conditions prior to submitting bid. No allowance will be made subsequently, in this connection, on behalf of the Contractor for any error or negligence on his part.
- E. Beginning of demolition means the Contractor accepts existing conditions.

### **3.02 PREPARATION**

- A. Disconnect mechanical systems in areas scheduled for removal. Notify Project Engineer and Owner of areas to be affected by mechanical demolition work prior to commencing.
- B. Disconnect utilities in areas scheduled for removal. Notify Project Engineer and Owner of areas to be affected by plumbing demolition work prior to commencing.

### **3.03 SELECTIVE DEMOLITION AND EXTENSION OF EXISTING MECHANICAL WORK**

- A. Demolish and remove from site and extend existing mechanical work under provisions of this Division and as indicated on the Drawings unless otherwise noted.
- B. Salvage items noted to remain the property of the Owner shall be delivered to a location to be designated by the Owner. Contractor shall remove from construction areas all trash or debris as it accumulates and dispose of it off site at no additional cost to the Owner. All construction areas shall be kept clean, safe, and orderly at all times. At the completion and acceptance for work, Contractor shall remove from the site all debris and surplus materials resulting from this work and dispose of them off site at no additional cost to the Owner.
- C. Do not use cutting torches until work area is clear of flammable materials. At concealed spaces verify condition and contents of hidden space before starting flame cutting operations. Maintain Fire Watch and portable fire-suppression devices during flame-cutting operations. Maintain and evaluate ventilation during flame-cutting operations.
- D. Maintain ventilation for dust control during selective demolition process. Verify Owner requirements for dust control and conform to their standards for all demolition activities.
- E. Remove, relocate, and extend existing installations to accommodate new construction as required for proper installation and system operation.
- F. Remove all accessories above grade. When removing equipment or terminal devices all associated pipe, etc. shall be removed and capped as required. Cut piping, tubing, etc. behind walls, above ceilings and below floors, and patch surfaces to match existing conditions. Finishes will be by others unless otherwise noted in documents.
- G. Fill all abandoned waste lines below floor slabs with low stress grout.
- H. Neatly cut openings and holes plumb, square and true to dimension required. Use cutting methods least likely to damage construction to remain or adjoining construction. Cut and drill from exposed surfaces into concealed surfaces to avoid marring or spalling of finished surfaces. Temporarily cover openings to remain.

- I. Patch all openings created by removal of mechanical equipment, ATC devices, ducts, pipes, etc. unless noted as being patched by others. Openings to be patched to match existing with similar materials and finish unless otherwise noted.
- J. Seal all existing roof penetrations, which will not be reused. Roof patching shall be by project roofing contractor, or an Owner approved roofing contractor.
- K. Remove, relocate, or provide brackets, hangers, and other accessories as required.
- L. Repair adjacent construction and finishes damaged during demolition and extension work.
- M. Maintain access to existing mechanical installations, which remain active.

#### **3.04 CLEANING AND REPAIR**

- A. Clean and repair existing materials and equipment, which remain or are to be returned to the Owner.
- B. All building surfaces damaged and openings left by new Work or the removal or relocation of mechanical equipment, piping, etc., shall be repaired to original condition and painted by the Contractor.

**END OF SECTION**

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**SECTION 22 0100  
PLUMBING GENERAL REQUIREMENTS**

**PART 1 GENERAL**

**1.01 APPLICABILITY**

- A. This section applies to and forms a part of each of the sections of Division 22. This section, and each of the sections to which it applies, is subject to the requirements of the Instructions to Bidders, General Conditions, and Special Conditions of these complete specifications.
- B. The work covered by this Division of the Specifications consists of furnishing all labor, supervision, equipment, materials, all incidentals, related items, and appurtenances, and performing all operations necessary to complete the installation of work in strict accordance with these specifications and drawings.
- C. Only such items as are hereinafter specified or indicated on the drawings to be furnished by others, shall be considered to be furnished by others. All other items are to be considered as a part of this Contract and shall be so bid.
- D. The omission of specific reference to any parts necessary to, or reasonably incidental to, a complete installation shall not be construed as releasing the Contractor from furnishing and installing same.
- E. All work shall be finished, tested and ready for operation.

**1.02 DEFINITIONS**

- A. Word "Furnish" where written in Division 22 specifications and drawings shall mean Contractor shall deliver to the site item(s) specified, as well as additional specialized materials and/or accessories necessary for the use and operation of item or items specified.
- B. Word "Install" where written in Division 22 specifications and drawings shall mean Contractor shall set in position, connect (including sub-assemblies furnished), and adjust for use. Contractor shall furnish miscellaneous specialty items such as hangers, valves, unions, piping, sheet metal, etc., as obviously necessary for a complete and operating installation.
- C. Word "Material" where written in Division 22 specifications and drawings shall mean any and all apparatus, equipment, devices, fixtures, components, products, assemblies, items, parts, things, and any other pieces specified or shown or required.
- D. Word "Labor" where written in Division 22 specifications and drawings shall mean any and all physical effort, manpower, time, expertise, tools, equipment, and services to carefully assemble, install and affix all material in a proper, complete, and acceptable manner.
- E. Word "Provide" where written in Division 22 specifications and drawings shall mean "Mechanical Contractor shall furnish all labor and material and completely and properly install such material and leave same in acceptable condition and intended acceptable working order".

**1.03 DISCREPANCIES OR OMISSIONS FROM DRAWINGS OR DOCUMENTS**

- A. Notify the Engineer of any discrepancies in, or omissions from the drawings or documents. Neither the Owner nor the Architect will be responsible for any oral instructions or modifications of the specifications or drawings. Written interpretations will be made only by Addenda.
- B. If discrepancies are not reported, the contractor shall bid the greater quantity or better quality (highest dollar value), and appropriate adjustment will be made after contract award.
- C. Discrepancies discovered during construction shall immediately be called to the attention of the Architect/Engineer for clarification.
- D. All minor items necessary for the completion and successful operation of the system, whether or not herein definitely specified or indicated on the drawings, shall be furnished, and installed.

- E. Omission of/or express reference to any material necessary for/or reasonably incidental to complete installation shall not release Contractor from providing such material. Where material is shown on drawings but is not specified or is specified but not shown, such material shall be considered both shown and specified.
- F. Any work not clear to Contractor shall be referred to Engineer for clarification before bid is submitted. If no question is raised prior to opening of bid, Contractor shall be required to provide work in question as directed by Engineer, whose decision is final, without additional charges.
- G. By virtue of submitting a bid, Contractor agrees that he is skilled and experienced in use of and in interpretation of drawings and specifications. Contractor further agrees that he has carefully reviewed all drawings, all specifications, and all addenda, which constitute bid documents for this contract, and finds them free of ambiguities and good and sufficient for bidding and construction purposes.

#### **1.04 DRAWINGS**

- A. The drawings indicate the extent and general layout of the mechanical systems intended for the building. Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings, connections, and accessories which may be required. Furnish offsets, fittings, valves, and accessories as may be required, to produce a complete and operating installation of type shown and specified.
- B. All piping and ductwork shall be routed so as not to obstruct access to other equipment (i.e. VAV box controls, electrical devices, fire alarm devices, etc.). Routing indicated on drawings is representative of intended location but shall be field verified. It shall be this contractor's responsibility to coordinate with other trades for accessibility.
- C. Any work or system on the roof not explicitly indicated on the roof plan shall be approved by the engineer prior to installing.
- D. In general, the mechanical equipment drawings are drawn to scale as noted. Obtain dimensions and locations of partitions, walls, etc., from the Architectural drawings wherever possible and do not scale the mechanical drawings. Consult the Architectural drawings for details of construction, location of suspended ceilings, ceiling heights, and other pertinent information. Architect's drawings shall not take precedence over field measurements.
- E. All drawings and specifications shall be considered in bidding. The drawings and specifications are complimentary, and what is called for in either of these shall be as binding as though called for by both. Should any conflict arise between drawings and specifications, such conflict shall be brought to the attention of the Architect.

#### **1.05 SITE INSPECTION**

- A. Before submitting a proposal for the work contemplated in these specifications and accompanying drawings, each bidder shall examine the site and familiarize themselves with all the existing conditions and limitations, including the extent of demolition, cutting, and patching to be done by the Contractor for Mechanical Work. No extras will be allowed because of the Contractor's misunderstanding as to the amount of work involved, or his lack of knowledge of any condition in connection with the work.

#### **1.06 PRIOR APPROVAL REQUESTS**

- A. Where the Bid Documents stipulate a particular Product, substitutions will be considered by the Engineer up to 10 days before receipt of bids.
- B. The submission shall provide complete information, test, etc. relating to quality, performance, suitability, to determine acceptability of such products.
- C. When a request to substitute a Product is made, the Engineer may approve the substitution and will issue an Addendum to known bidders.

- D. Provide Products as specified unless substitutions are submitted in this manner and subsequently accepted.
- E. The cost of any changes of other trades as a result of use of the substitution material or equipment must be borne by the Contractor submitting such material or equipment.

#### **1.07 REVIEW OF MECHANICAL MATERIALS AND EQUIPMENT**

- A. Within thirty (30) days after award of construction contracts, Contractor shall submit for acceptance to the Architect quantity of shop drawings specified for the equipment indicated in these specifications. The shop drawings shall include the equipment manufacturer's name and address, catalog designation or model number, rough-in data & dimensions, performance curves and rated capacities & operational characteristics.
- B. The Contractor shall thoroughly review each item for compliance with these Specifications making any necessary corrections prior to submittal. Each shop drawing set shall be stamped, signed, and dated indicating Contractor review and submitted electronically via PDF file format. The PDF file name shall include the relevant specification section number for reference. If the Contractor fails to properly review shop drawings, the Contractor shall reimburse the Engineer for all additional reviews on a time and material basis.
- C. Provide samples of materials or equipment proposed to be furnished, if requested. Samples shall become the property of the Architect/Engineer and will be returned only when accompanied by a written request to do so.
- D. None of the items listed shall be purchased, delivered to the site, or installed, until the item is reviewed. No substitution will be permitted after review except where such substitution is considered by the Architect to be in the best interest of the Owner.
- E. The Engineer will review all Shop Drawings submitted and will retain a copy for record file.
- F. Approval Stamp: This review is to verify general conformance with the design concept of the Project and substantial compliance with the information provided in the Contract Documents. This review does not in any way relieve the Contractor or their suppliers of their responsibility to provide all materials and equipment as specified, in quantities, quality and dimensions required. Submittals will be reviewed with the following actions:
  - 1. "No Exception Noted" indicates that the Submittal appears to conform to the design concept of the Work and that the Contractor, at his discretion, may with fabrication and/or procurement and installation.
  - 2. "Make Corrections Noted" indicates that the Submittal, after noted corrections are made, appears to conform to the design concept of the Work and that the Contractor, at his discretion, may proceed with fabrication and/or procurement and installation, if the corrections are accepted by the Contractor without any increase in Contract Sum or Time.
  - 3. "Revised and Resubmit" indicates that the noted revisions are such that a corrected copy of the Submittal is required for review to confirm that the noted revisions have been understood and made. The Contractor, at his discretion, may proceed with fabrication and/or procurement and installation after submitting a corrected copy and verifying with the reviewer that the corrected copy is acceptable, if the corrections are accepted by the Contractor without an increase in the Contract Sum or Time.
  - 4. "Rejected" indicates that the Submittal does not appear to conform to the specifications, a resubmission is required, and fabrication or procurement is not authorized.
- G. If the Engineer rejects (Revised and Resubmit or Rejected) the same section two times the engineer shall be compensated for additional reviews. Any subsequent submittal will require the inclusion of a check made out to the engineer in the amount of \$ 500.00. Contractor is responsible for all delays caused by the resubmittal process.
- H. Should the contractor fail to comply with any of the requirements of the preceding sub-paragraphs; then the right is reserved by the Architect to select any or all items in the material

schedule, with that selection to be final and binding upon the contractor. The materials selected or reviewed, as the case may be, by the Architect, shall be used in the work at no additional cost to the Owner.

- I. When the contractor chooses to furnish and reviewed material or equipment that requires electrical specifications/connections (circuit breaker, conduit, wire, labor, etc.) different than shown and/or scheduled on the drawings, or specified in detail, the contractor shall be responsible for coordinating any necessary changes and shall bear the cost of such changes (including engineering costs).
- J. Connections and equipment clearances are based on the manufacturer scheduled. Any deviations in size, weight, and/or configuration shall be the responsibility of the contractor. Equipment by other approved manufacturers will be acceptable if of a similar type and grade and if of approximately the same general overall dimensions. Quality, construction and performance must be equal to or better than that specified.
- K. When the contractor chooses to furnish any reviewed material or equipment that requires electrical specifications/connections (circuit breaker, conduit, wire, labor, etc.) different than shown and/or scheduled on the drawings, or specified in detail, the contractor shall be responsible for coordinating any necessary changes and shall bear the cost of such changes (including engineering costs).
  - 1. Submit detailed documentation of all required changes, confirmation of coordination with the Electrical Contractor, and an estimated cost breakdown prior to ordering.
- L. All contractor requested changes from the design, including size, weight, configuration, and electrical modifications, must be submitted for review and proof of coordination prior to approval.

#### **1.08 PROPOSAL REQUESTS AND INSTRUCTIONS**

- A. For any proposal request or instruction that requires an adjustment to the Contract Sum, submit an itemized quotation for the change(s) described in the proposed modifications to the Contract Documents. Proposal shall also indicate credits, deducts, and/or offsets for material and labor originally included in contract.
  - 1. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. Breakdown shall include amounts, lengths, quantities, types, sizes, etc. of material.
  - 2. Indicate applicable taxes, O&P, delivery charges, equipment rental, and other incidental charge.
  - 3. Include costs of labor and supervision directly attributable to the change.
  - 4. All sub-contractor pricing shall include the same breakdown as described above.

#### **1.09 WARRANTY**

- A. All equipment and installation shall be provided with a 1-year warranty beginning with substantial completion.
- B. Refer to individual spec sections for specific warranty information that is different than stated above.
- C. Submit warranty with related forms completed in Owner's name and registered with manufacturer.

#### **1.10 MANUALS**

- A. In addition to catalog data and shop drawings submitted for review, this contractor shall furnish two (2) final Operation and Maintenance Manuals for the mechanical systems. Manuals shall be delivered to the Architect before final observation of the work.

- B. Operation and Maintenance Manuals shall be furnished in PDF electronic format as well as two (2) copies bound in new hard backed 3 ring binders with the title "Operations and Maintenance Manuals" and the project title clearly printed on the front cover and side of binder .
- C. Provide an index at the beginning of the manual for the sections included in the manual.
- D. All sections in hard copy manuals shall be referenced with plastic tabs.
- E. Include at the front of the manual a complete listing of the Architect, Engineer and contractors and sub-contractors used on the project. Listing shall include names, addresses and phone numbers for each.
- F. Manuals shall be arranged in order similar to the specifications. All major pieces of equipment shall be referenced with tabs. At the beginning of each section, the equipment supplier's name, address, and phone number shall be provided.
- G. Data for equipment included in the manuals shall include:
  - 1. Approved shop drawings clearly showing the models, sizes and capacities of equipment used.
  - 2. Operations Manuals detailing step by step procedure to follow putting the equipment into operation.
  - 3. Maintenance Manuals from the manufacturer of each piece of equipment including instructions on installation, maintenance, and lubrication. Manuals shall include parts lists for all replacement parts.
- H. The following items shall also be included in the manuals for the Owners information: Valve Tag list and Signed owner instruction forms for all items specified as requiring owners instruction
- I. Operations and Maintenance Manuals shall be submitted to the Engineer for approval prior to delivery to the Architect.

#### **1.11 INSTRUCTION OF OWNER'S EMPLOYEES**

- A. Furnish, without additional expense to the Owner, the services of competent instructors, who will give full instructions in the care, adjustment, and operation of all parts of the mechanical equipment to the Owner's employees who are to have charge of the equipment.
- B. An Operating and Maintenance Manual shall be made available to the Owner's operating personnel during the instruction and left with the Owner upon completion of the instruction.
- C. The number of man hours of instruction furnished for each system shall be as specified below. Hours of instruction shall be divided up into a minimum of two (2) instruction periods with 75% of time used for an initial instruction and 25% of time used for a follow up instruction, a minimum of four (4) weeks after initial instruction.
- D. "Instruction of Owner's Employees" form at end of section shall be filled out and signed by Contractor and Owner's Representative and three (3) signed copies of form sent to Engineer.
- E. Owner training and instructions:
  - 1. Plumbing systems including but not limited to water heaters, sump pumps and controls, plumbing fixtures, and \_\_\_\_ shall not be less than four (4) man hours.

#### **1.12 MECHANICAL LIST OF CONSTRUCTION CLOSEOUT DOCUMENTS**

- A. This Contractor and their subcontractors should proceed immediately to fully complete the work as listed in Appendix 'A' at the end of this Section. The Contractor responsible shall initial and date the "Contractor Completed" column after each item as it is complete and forward a copy of the fully completed punch list to the Engineers for their final approval before final punch list inspection. Reply with an N/A where items don't pertain.

#### **1.13 INSTALLATION OF EQUIPMENT**

- A. All equipment shall be installed and connected in accordance with manufacturer's instructions and recommendations unless such instructions are in conflict with these specifications.

Auxiliary piping, valves, electrical connections, etc., recommended by the manufacturer or required for proper operation shall be furnished and installed complete.

- B. All equipment shall be installed in such a manner and location as to facilitate accessibility for maintenance and/or replacement.

#### **1.14 RECORD DRAWING**

- A. The contractor shall maintain one set of drawings at the job site used as a master copy. Each change order or other revision, deletion, or addition shall be clearly marked and noted by colored pencil. This copy of plans shall be furnished to the Architect upon completion of the project.
- B. The contractor shall note on the record drawings the elevations and/or inverts of water service where it exits the building foundation.

#### **1.15 COOPERATION WITH OTHER TRADES**

- A. Cooperate with other trades so as to avoid interferences. Where required to avoid interferences with other work or to increase the headroom. Carefully check all construction details to assure the proper installation of all work under this specification. Schedule the work such that it will keep pace with the work of other crafts and cause no delay.

#### **1.16 INSPECTION OF SITE**

- A. Before submitting a proposal on the work contemplated in these specifications and accompanying drawings, each bidder shall examine the site and familiarize himself with all of the existing conditions and limitations. No extras will be allowed because of Contractor's misunderstanding as to the amount of work involved or lack of his knowledge of any condition in connection with the new construction.

#### **1.17 PAVEMENT, CURB AND SIDEWALK REPLACEMENT**

- A. This Contractor shall be responsible for replacement of existing street pavement, curbs, and sidewalks, etc., removed or damaged by them during the course of the work, unless such pavement, curbs, sidewalks are to be constructed under the General Contract. The work shall be done in accordance with local requirements.

#### **1.18 CODES, ORDINANCES, REGULATIONS & STANDARDS**

- A. The entire installation shall be made in accordance with all state and local laws. If, in any instance, the plans and specifications conflict with such laws, the law shall take precedence. This, however, shall not be construed as relieving the contractor from complying with any requirements of the drawings and specifications that may be in excess of the rules and not contrary to the same.
- B. All work shall conform to applicable state and local codes, ordinances, regulations and/or standards.

#### **1.19 PERMITS AND LICENSES**

- A. This contractor shall obtain and pay for all licenses and permits and shall pay for all fees and charges for the connection to outside services and use of property other than the site of the work for storage of materials or other purposes.
- B. Contractor shall coordinate and request all inspections from authority having jurisdiction. The Contractor shall notify the Architect of all such coordinated inspections (date & time) and shall submit certificates of inspection and final approval of the local inspection authority.

#### **1.20 TESTS**

- A. Test all equipment installed under these specifications and demonstrate its proper operation to the Engineer.

- B. Do not test or operate equipment for any purpose, until it has been fully lubricated in accordance with the manufacturer's instructions and, if it is a centrifugal pump, until it has been connected to the piping system with sufficient water so that it will not run dry.
- C. All testing shall be completed before final inspection, and test results shall be available during the final inspection.

#### **1.21 GUARANTEES**

- A. This contractor shall guarantee all equipment, material, and workmanship for a period of one year from date of final certificate. Any defects in mechanical equipment, workmanship or materials that appear, or cause trouble of any kind within a period of one year from date of final certificate shall be remedied, free of charge. Refer to other sections of these specifications for guarantees in excess of the requirements herein described.

#### **1.22 CONSTRUCTION CLOSEOUT DOCUMENTS**

- A. This Contractor and their subcontractors should proceed immediately to fully complete the work as listed at the end of this Section. The Contractor responsible shall initial and date the "Contractor Completed" column after each item as it is complete and forward a copy of the fully completed punch list to the Engineers for their final approval before final punch list inspection. Reply with an NA where items don't pertain.

### **PART 2 PRODUCTS**

#### **2.01 NOT USED**

**PART 3 EXECUTION**

**3.01 INSTRUCTION TO OWNER'S EMPLOYEES FORM:**

DATE \_\_\_\_\_

**INSTRUCTION OF OWNER'S EMPLOYEES**

This letter shall certify that the Contractor has furnished the Owner with full instructions in the care and operation of all parts of the plumbing system as specified under Section 22 0100 paragraph entitled "Instruction of Owner's Employees".

Owner's Initial Instructions				Owner's Follow-up Instructions		
Section	Hours	Date	Initials	Hours	Date	Initials
Special Piping Systems						
Plumbing						
Contractor						
Owner's Representative						

**3.02 LIST OF CONSTRUCTION CLOSEOUT DOCUMENTS**

<u>DIVISION</u>	<u>DOCUMENT</u>	<u>DATE / INITIALS</u>	<u>APPROVED</u>
22 00 00	Record drawings - Plumbing		
22 00 00	O&M Manuals - Plumbing		
22 00 00	Owners Instruction - Plumbing		
22 00 00	Documentation of domestic water system has been chlorinated and flushed.		
22 00 00	Valve tag schedule - Plumbing		
22 00 00	Provide stainless steel wall escutcheon on waste pipe through the wall for lavatories and sinks		
22 00 00	Adjust all wrist blade handles on sinks to 30 degrees		
22 00 00	Provide all equipment labels per specifications		
22 00 00	Contractor to ensure above ceiling piping is insulated		
22 00 00	Color match caulk water closets, urinals, mop basins, hand sinks, showers, etc., to match fixture		
22 00 00	Label all piping per specifications		
22 00 00	Insulate valves, strainers, unions, fittings per specifications.		
22 00 00	Submit factory/contractor start-up reports		
22 00 00	Clean all mechanical areas of debris, wipe down all fixtures and equipment. Remove all extra material and garbage from site.		
22 00 00	Ensure all holes existing and new have been patched. All openings remaining around pipe penetrations filled, caulked, and painted to match walls.		

**END OF SECTION**

**SECTION 22 0150  
PLUMBING & PIPING MATERIALS & METHODS**

**PART 1 GENERAL**

**1.01 APPLICABILITY**

- A. This section covers basic materials and methods and applies to and forms a part of each of the sections of Division 22.
- B. This work shall be in accordance with this and other applicable sections and/or provisions of these specifications and with the applicable drawings.

**1.02 MATERIALS & MANUFACTURERS**

- A. All materials and equipment shall be new, free of defects, installed in accordance with manufacturer's current published recommendations in a neat manner and in accordance with standard practice of the industry.
- B. Certain materials and/or equipment in this specification are specified by manufacturer and catalog numbers. The design was based on the specified equipment and establishes a degree of quality, performance, physical configuration, etc. If the contractor should elect to use equipment other than the equipment used as a basis for design but listed as "acceptable" in the specifications, he shall be responsible for space requirements, configuration, performance, and changes in bases, supports, vibration isolators, structural members, openings in structure and other apparatus that may be affected by its use.

**PART 2 PRODUCTS**

**2.01 NOT USED**

**PART 3 EXECUTION**

**3.01 COORDINATION OF OPENINGS**

- A. This contractor shall coordinate all openings required for new piping, equipment, controls, etc. through any structural slabs, beams, or walls. Contractor shall request a copy of the precast concrete shop drawings and verify locations and sizes of all openings required.
- B. All costs associated with structural field changes or redesigns of the building systems due to lack of field coordination shall be responsibility of this contractor.

**3.02 PIPE AND FITTING INSTALLATION**

- A. Plastic DWV piping shall be installed as addressed by IAPMO (UPC) code section on Expansion and Contraction. Any straight runs of plastic DWV piping exceeding 30 feet shall be installed to accommodate thermal expansion.
- B. Piping is to be installed as shown on the drawings as much as practical. When a pipe size is not indicated, the subcontractor shall request the pipe size from the Architect through the Plumbing Contractor.
- C. Provide sufficient swing joints, expansion loops, and/or devices necessary and install so as to permit free expansion and contraction of piping without causing undue stresses. Make all changes in direction with fittings. Support piping independently at all equipment so that its weight shall not be supported by the equipment.
- D. Install piping without springing or forcing and clear all windows, doors, and other openings. Excessive cutting or other weakening of the building structure to facilitate piping installation will not be permitted.
- E. All pipes shall be reamed to full pipe diameter before joining.
- F. Install vertical risers plumb and straight, horizontal lines parallel with walls and partitions. Conceal piping above ceilings and within furring and/or walls when practical.

- G. Provide shut-off valves and unions suitably located to isolate each item of equipment, branch circuit or section of piping.
- H. Provide 1/2" drain valves at all low points of each system to enable complete drainage.
- I. Provide "Clearflow" dielectric waterways at all junctions of dissimilar metals in potable water systems.
- J. All piping shall be adequately supported from the building structure with adjustable hangers to maintain uniform grading where required and to prevent sagging or pocketing.
- K. Provide supports between piping and building structure where necessary to prevent swaying.
- L. The use of wire or perforated metal to support pipe will not be permitted.

### **3.03 PROTECTION, DELIVERY AND STORAGE OF MATERIALS**

- A. Make provisions for the delivery and storage of materials and make the required arrangements with other contractors for the introduction into the building of equipment too large to pass through finished openings.
- B. Protect materials and equipment stored on site from weather and moisture by maintaining factory covers and/or suitable weather-proof coverings. For extended outdoor storage, motors shall be removed from equipment and stored separately.
- C. The open ends of all piping shall be covered whenever that system is not being worked on, i.e. end of the workday, completion of a section, etc. Covering shall keep dust, garbage, vermin, and other foreign objects out of the piping when the contractor is not on the jobsite.

### **3.04 CUTTING AND REPAIRING**

- A. All holes and penetrations required for the installation of the plumbing equipment shall be by the plumbing contractor. This shall include all piping, ductwork, and any other penetration through the wall, floor, or roof.
- B. Cutting construction shall be done only with the written permission of the Architect. Cutting shall be done carefully and damage to buildings, pipes, wiring, or equipment as a result of cutting for installation shall be repaired by skilled mechanics of the trade involved at no additional charge to the Owner. This Contractor shall be responsible for all cutting and patching unless such work has been delegated to the General Contractor.
- C. All holes cut into concrete shall be cut by means of power saws or core drills. All unsightly spalls or chips shall be repaired.
- D. All openings remaining around duct and pipe penetrations shall be filled, caulked, and painted to match wall. Code approved fire caulking shall be used for all rated penetrations.

### **3.05 SEALING FLOOR, CEILINGS AND WALL OPENINGS**

- A. Where pipes pass through walls, ceilings, floors, or partitions, (other than those through fire rated walls or chases) the opening in the construction around the pipe shall not exceed 1/2 inch average clearance on all sides and shall be sealed to prevent the passage of sound and air. Coordinate wall openings to allow insulation thickness to pass through walls if allowed.
- B. The material used to seal space between the wall and the pipe shall be non-combustible caulk type, or wrap type, as conditions require. Provide sheet metal angles or flanges as may be required to contain the stopping material. Use of expanding foam will be allowed if surfaces are cleaned of an excess material and all edges are trimmed smooth. Penetrations through exterior walls shall be sealed weather tight.
- C. Special attention shall be given to penetrations of mechanical room walls. Fill gaps around entire exterior area of the pipes with sound insulation (batt or mineral wool) to within 1/2" of the wall surface. Use silicone caulking to finish filling the opening smooth with the wall surface or

provide sheet metal angles. All sealer shall meet flame spread 25 and smoke developed less than 50.

- D. Where pipes pass through fire-rated walls, ceilings, floors, vertical service shafts walls, or partitions, the opening in the construction around the pipe or duct shall be fire-stopped to prevent the passage of flame and smoke. All assemblies shall be UL or ASTM listed to provide a fire rating equal to that of the construction being penetrated. For the firestop applications that exist for which no UL tested system is available through a manufacturer, an engineering judgment derived from similar UL system designs or other tests shall be submitted from the manufacturer to the local authorities having jurisdiction for their review and approval prior to installation. Individuals installing the firestopping shall be experienced and certified as required by the manufacturer whose product is being applied. Refer to firestopping spec section for more information.
- E. Acceptable manufacturers shall be Hilti, 3M Brand, or a prior approved product.

### **3.06 CLEANING AND PAINTING**

- A. Clear away all debris, surplus materials, etc., resulting from work or operations, leaving the job and equipment furnished under this contract in a clean condition.
- B. All equipment being furnished with finished paint coat shall be examined upon job completion for scratches and other surface damage. All finished surfaces where necessary shall be touched up with touch-up paint of color to match the factory finish.
- C. Paint all exposed bare pipe exterior of the building. Bare pipe shall be painted one coat of No. 7769402 damp-proof red primer as manufactured by Rust-Oleum Corporation, or equal, and one coat of oil paint. Final coat shall be of a color selected by the architect.
- D. Paint all exposed iron and steel work, pipe hangers, pipe stands, uninsulated tanks, supporting steel for equipment and exposed bare pipe in mechanical areas. Iron and steel work and bare pipe shall be painted one coat of No. 4769402 damp-proof red primer as manufactured by Rust-Oleum Corporation, or equal, and one coat of oil paint. Iron and steel work shall be painted black.
- E. Refer to Section 09, Painting for additional requirements.

### **3.07 ASBESTOS FREE BUILDING**

- A. There shall be no products or building materials used as a temporary or permanent element in the construction of this building, which has in its make-up any form of asbestos. The contractors shall be responsible to monitor shop drawings and product literature to verify the make-up of materials to be used in the building and remind material suppliers that their products must be asbestos free.
- B. Notify the Architect immediately of any existing materials which are suspected of containing asbestos. Do not disturb or attempt to remove any asbestos containing material. The Architect will contact the Owner and inform them of the Contractors observations. The Owner will obtain and provide the services of professionals skilled in asbestos removal.

### **3.08 SALVAGE**

- A. All items removed from existing building shall be salvaged in a workmanlike manner.
- B. The handling, storage, and disposition of salvage materials shall be as directed by the Architect. Generally, all salvage material shall remain the property of the Owner. Materials and equipment not wanted by Owner shall be removed from the job site and become the property of the contractor.

**END OF SECTION**

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**SECTION 22 0523  
GENERAL-DUTY VALVES FOR PLUMBING PIPING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Ball valves.

**1.02 REFERENCE STANDARDS**

- A. ASME B1.20.1 - Pipe Threads, General Purpose, Inch; 2013 (Reaffirmed 2018).
- B. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250; 2026.
- C. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 Through NPS 24 Metric/Inch Standard; 2025.
- D. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2021.
- E. ASME B31.9 - Building Services Piping; 2020.
- F. ASME BPVC-IX - Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators - Welding Brazing and Fusing Qualifications; 2019.
- G. AWWA C606 - Grooved and Shouldered Joints; 2015.
- H. NSF 61 - Drinking Water System Components - Health Effects; 2017.
- I. NSF 372 - Drinking Water System Components - Lead Content; 2016.

**1.03 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Product Data: Provide data on valves including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.
- C. Closeout Documents:
  - 1. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts listings.

**1.04 QUALITY ASSURANCE**

- A. Manufacturer:
  - 1. Obtain valves for each valve type from single manufacturer.
  - 2. Company must specialize in manufacturing products specified in this section, with not less than five years of documented experience.
- B. Welding Materials and Procedures: Comply with ASME BPVC-IX.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Use the following precautions during storage:
  - 1. Maintain valve end protection and protect flanges and specialties from dirt.
  - 2. Store valves in shipping containers and maintain in place until installation.
    - a. Store valves indoors in dry environment.

**PART 2 PRODUCTS**

**2.01 APPLICATIONS**

- A. See drawings for specific valve locations.
- B. Listed pipe sizes shown using nominal pipe sizes (NPS) and nominal diameter (DN).
- C. Provide the following valves for the applications if not indicated on drawings:

1. Shutoff: Ball.
  2. Throttling: Ball.
- D. Substitutions of valves with higher CWP classes or WSP ratings for same valve types are permitted when specified CWP ratings or WSP classes are not available.
- E. Domestic, Hot and Cold Water Valves, low-lead compliant:
1. 2 inch and Smaller:
    - a. Bronze: Provide with solder-joint, threaded, or press-fit ends.
    - b. Ball: Two piece, full port, bronze with stainless-steel trim.

## 2.02 GENERAL REQUIREMENTS

- A. Valve Pressure and Temperature Ratings: No less than rating indicated; as required for system pressures and temperatures.
- B. Valve Sizes: Match upstream piping unless otherwise indicated.
- C. Valve Actuator Types:
1. Hand Lever: Quarter-turn valves 6 NPS and smaller.
- D. Insulated Piping Valves: With 2 inch stem extensions and the following features:
1. Ball Valves: Extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.
- E. Valve-End Connections:
1. Threaded End Valves: ASME B1.20.1.
  2. Flanges on Iron Valves: ASME B16.1 for flanges on iron valves.
  3. Pipe Flanges and Flanged Fittings 1/2 inch through 24 inch: ASME B16.5.
  4. Solder Joint Connections: ASME B16.18.
  5. Grooved End Connections: AWWA C606.
- F. General ASME Compliance:
1. Solder-joint Connections: ASME B16.18.
  2. Building Services Piping Valves: ASME B31.9.
- G. Potable Water Use:
1. Certified: Approved for use in compliance with NSF 61 and NSF 372.
  2. Lead-Free Certified: Wetted surface material includes less than 0.25 percent lead content.
- H. Source Limitations: Obtain each valve type from a single manufacturer.
- I. Press-Fit Valve Manufacturers:
1. Watts
  2. Viega
  3. Milwaukee
  4. Apollo
  5. NIBCO
- J. Valve manufacturers unless otherwise noted:
1. Apollo
  2. Jomar
  3. NIBCO
  4. Hammond
  5. Milwaukee
  6. Watts
  7. Substitutions: See Section 01 6000 - Product Requirements.

## **2.03 BRONZE, BALL VALVES**

- A. General:
  - 1. Fabricate from dezincification resistant material.
  - 2. Copper alloys containing more than 15 percent zinc are not permitted.
- B. Two Piece, Full Port with Stainless Steel trim.
  - 1. WSP Rating: 150 psi.
  - 2. WOG Rating: 600 psi.
  - 3. Body: Forged bronze or dezincified-brass alloy.
  - 4. Ends Connections: Pipe thread or solder.
  - 5. Seats: PTFE.
  - 6. Stem: Stainless steel, blowout proof.
  - 7. Ball: Stainless steel.
  - 8. Operator: Provide lockable handle and stem extension.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Discard all packing materials and verify that valve interior, including threads and flanges are completely clean without signs of damage or degradation that could result in leakage.
- B. Verify valve parts to be fully operational in all positions from closed to fully open.
- C. Confirm gasket material to be suitable for the service, to be of correct size, and without defects that could compromise effectiveness.
- D. Should valve is determined to be defective, replace with new valve.

### **3.02 INSTALLATION**

- A. Provide unions or flanges with valves to facilitate equipment removal and maintenance while maintaining system operation and full accessibility for servicing.
- B. Provide separate valve support as required and locate valve with stem at or above center of piping, maintaining unimpeded stem movement.

**END OF SECTION**

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**SECTION 22 0553  
IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Tags.
- B. Pipe markers.
- C. Ceiling tacks.

**1.02 REFERENCE STANDARDS**

- A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2023.

**1.03 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Product Data: Provide manufacturers catalog literature for each product required.
- C. Closeout Documents:
  - 1. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.
    - a. Submit plumbing component identification schedule listing equipment, piping, and valves.
    - b. Detail proposed component identification data in terms of of wording, symbols, letter size, and color coding to be applied to corresponding product.
    - c. Valve Data Format: Include id-number, location, function, and model number.
  - 2. Project Record Documents: Record actual locations of tagged valves.
- D. Project Record Documents: Record actual locations of tagged valves.

**PART 2 PRODUCTS**

**2.01 PLUMBING COMPONENT IDENTIFICATION GUIDELINE**

- A. Nameplates:
  - 1. Heat exchangers, water heaters, and other heat transfer products.
  - 2. Control panels, transducers, and other related control equipment products.
  - 3. Pumps, tanks, filters, water treatment devices, and other plumbing equipment products.
- B. Tags:
  - 1. Piping: 3/4 inch diameter and smaller.
  - 2. Manual operated and automated control valves.
  - 3. Instrumentation, relays, gauges, and other related control equipment products.
- C. Pipe Markers: 3/4 inch diameter and higher.

**2.02 IDENTIFICATION APPLICATIONS**

- A. Piping: Pipe markers.
- B. Valves: Tags and ceiling tacks where located above lay-in ceiling.

**2.03 TAGS**

- A. Manufacturers:
  - 1. Advanced Graphic Engraving: [www.advancedgraphicengraving.com](http://www.advancedgraphicengraving.com).
  - 2. Brady Corporation: [www.bradycorp.com/#sle](http://www.bradycorp.com/#sle).
  - 3. Brimar Industries, Inc.: [www.pipemarker.com/#sle](http://www.pipemarker.com/#sle).
  - 4. Craftmark Pipe Markers: [www.craftmarkid.com/#sle](http://www.craftmarkid.com/#sle).

5. Kolbi Pipe Marker Co: [www.kolbipipemarkers.com/#sle](http://www.kolbipipemarkers.com/#sle).
  6. Seton Identification Products: [www.seton.com](http://www.seton.com).
  7. Substitutions: See Section 01 6000 - Product Requirements.
- B. Flexible: Vinyl with engraved black letters on light contrasting background color with up to three lines of text. Minimum tag size 1-1/2 inch in diameter.
  - C. Metal: Brass, 19 gauge 1-1/2 inch in diameter with smooth edges, blank, smooth edges, and corrosion-resistant ball chain. Up to three lines of text.
  - D. Valve Tag Chart: Typewritten 12-point letter size list in anodized aluminum frame.
  - E. Piping: 3/4 inch diameter and smaller. Include corrosion resistant chain. Identify service, flow direction, and pressure.

## 2.04 PIPE MARKERS

- A. Manufacturers:
  1. Brady Corporation: [www.bradycorp.com](http://www.bradycorp.com).
  2. Brimar Industries, Inc: [www.pipemarket.com/#sle](http://www.pipemarket.com/#sle).
  3. Craftmark Pipe Markers: [www.craftmarkid.com/#sle](http://www.craftmarkid.com/#sle).
  4. Kolbi Pipe Marker Co: [www.kolbipipemarkers.com/#sle](http://www.kolbipipemarkers.com/#sle).
  5. Seton Identification Products: [www.seton.com](http://www.seton.com).
  6. Substitutions: See Section 01 6000 - Product Requirements.
- B. Comply with ASME A13.1.
- C. Flexible Tape Marker: Flexible, vinyl film tape with pressure-sensitive adhesive backing and printed markings. Provide sticker/tape with flow arrows around the circumference of the piping at each end of pipe marker to hold marker in place.
- D. Underground Flexible Marker: Bright-colored continuously printed ribbon tape, minimum 6 inches wide by 4 mil, 0.004 inch thick, manufactured for direct burial service.
- E. Identification Scheme, ASME A13.1:
  1. Primary: External Pipe Diameter, Uninsulated or Insulated.
    - a. 3/4 to 1-1/4 inches: Use 8 inch field-length with 1/2 inch text height.
    - b. 1-1/2 to 2 inches: Use 8 inch field-length with 3/4 inch text height.
    - c. 2-1/2 to 6 inches: Use 12 inch field-length with 1-1/4 inch text height.
    - d. 8 to 10 inches: Use 24 inch field-length with 2-1/2 inch text height.
    - e. Over 10 inches: Use 32 inch field-length with 3-1/2 inch text height.
  2. Secondary: Color scheme per fluid service.
    - a. Water; Potable, Cooling, Boiler Feed, and Other: White text on green background.
  3. Tertiary: Other Details.
    - a. Directional flow arrow band over pipe circumference.

## 2.05 CEILING TACKS

- A. Manufacturers:
  1. Craftmark: [www.craftmarkid.com](http://www.craftmarkid.com).
  2. Seton Identification Products: [www.seton.com](http://www.seton.com).
  3. 3M
  4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Description: Steel with 3/4 inch diameter color coded head.
- C. Color code as follows:
  1. Plumbing Equipment: Yellow.
  2. Plumbing Valves: Green.

## 2.06 CEILING IDENTIFICATION TAGS

- A. All plumbing valves shall be denoted with a small engraved tag, attached to the ceiling below the device. The tag shall be white engraved lettering, containing the numbered nomenclature used for the device on the mechanical schedules/drawings.
- B. Manufacturers:
  - 1. Brady Corporation: [www.bradycorp.com](http://www.bradycorp.com).
  - 2. Brimar Industries, Inc: [www.pipemarker.com/#sle](http://www.pipemarker.com/#sle).
  - 3. Craftmark Pipe Markers: [www.craftmarkid.com/#sle](http://www.craftmarkid.com/#sle).
  - 4. Kolbi Pipe Marker Co: [www.kolbipipemarkers.com/#sle](http://www.kolbipipemarkers.com/#sle).
  - 5. Seton Identification Products: [www.seton.com](http://www.seton.com).
  - 6. \_\_\_\_\_.
  - 7. Substitutions: See Section 01 6000 - Product Requirements.
- C. Markers:
  - 1. Use colored markers with pressure sensitive adhesive on one side.
  - 2. Make colored markers of plastic, 3/4 to 1 inch in wide by 2-1/2 to 3 inch long.
  - 3. Use markers of the same size throughout building.
  - 4. Color Code: Use following color markers for service identification:
    - a. Domestic Water: Valves and Controls - White on Green
    - b. Gas: Laboratory, Medical, Air and Vacuum Valves - Black on White

## PART 3 EXECUTION

### 3.01 PREPARATION

- A. Degrease and clean surfaces to receive identification products.

### 3.02 INSTALLATION

- A. All new piping shall be identified as to contents and direction of flow by stenciling or markers, as specified. Apply where pipes pass through walls (both sides of the wall), at each change of direction and on each 20 feet of straight lengths. For insulated pipe, stencil/marker size shall be based on insulation size, not pipe size.
  - 1. Identify service, flow direction, and pressure.
  - 2. Install in clear view and align with axis of piping.
- B. Piping shall be identified as to contents using the following list. Additional system details shall be included within this specification section.

Cold Water	C.W.
120° F Hot Water	H.W.
Recirculating Hot Water	R.H.W.
Sanitary Drain	SAN. DRAIN
Sanitary Vent	SAN. VENT
- C. Valves controlling mains, risers and branches, but not individual shut-off or local control valves on fixtures and equipment, shall be identified by a metal tag Schedules, framed under glass and mounted where directed, shall be provided showing a complete listing of all valve tags and giving numbers, locations, and color codes, if any, of pipes controlled. Frames shall be secured to wall by not less than four screws. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- D. Install tags in clear view and align with axis of piping.
- E. Install plastic tape pipe marker around pipe in accordance with manufacturer's instructions.

- F. Apply ASME A13.1 Pipe Marking Rules:
  - 1. Place pipe marker adjacent to changes in direction.
  - 2. Place pipe marker adjacent each valve port and flange end.
  - 3. Place pipe marker at both sides of floor and wall penetrations.
  - 4. Place pipe marker every 20 feet interval of straight run.
- G. Locate ceiling tacks to locate valves or dampers above lay-in panel ceilings. Locate in corner of panel closest to equipment.

**END OF SECTION**

**SECTION 22 0719  
PLUMBING PIPING INSULATION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Glass fiber insulation.
- B. Jacketing and accessories.

**1.02 REFERENCE STANDARDS**

- A. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2019, with Editorial Revision (2023).
- B. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation; 2025.
- C. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel; 2008 (Reapproved 2023).
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2021a.
- E. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.
- F. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

**1.03 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

**1.04 QUALITY ASSURANCE**

- A. Applicator Qualifications: Company specializing in performing the type of work specified in this section with minimum five years of experience.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

**1.06 FIELD CONDITIONS**

- A. Maintain ambient conditions required by manufacturers of each product.
- B. Maintain temperature before, during, and after installation for minimum of 24 hours.

**PART 2 PRODUCTS**

**2.01 REGULATORY REQUIREMENTS**

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

**2.02 GLASS FIBER INSULATION**

- A. Manufacturers:
  - 1. CertainTeed Corporation: [www.certainteed.com](http://www.certainteed.com).
  - 2. Johns Manville Corporation: [www.jm.com](http://www.jm.com).
  - 3. Knauf Insulation: [www.knaufusa.com](http://www.knaufusa.com).
  - 4. Owens Corning Corporation: [www.ocbuildingspec.com/sle](http://www.ocbuildingspec.com/sle).
  - 5. Substitutions: See Section 01 6000 - Product Requirements.

- B. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.
  - 1. K Value: ASTM C177, 0.24 at 75 degrees F.
  - 2. Maximum Service Temperature: 850 degrees F.
  - 3. Maximum Moisture Absorption: 0.2 percent by volume.
- C. Vapor Barrier Jacket: White Kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm.
- D. Vapor Barrier Lap Adhesive: Compatible with insulation.

### **2.03 JACKETING AND ACCESSORIES**

- A. PVC Plastic Jacket:
  - 1. Manufacturers:
    - a. Johns Manville Zeston 2000 Series White PVC or equal.
    - b. Substitutions: See Section 01 6000 - Product Requirements.
  - 2. Jacket: One piece molded type fitting covers and sheet material, off-white color.
    - a. Minimum Service Temperature: 0 degrees F.
    - b. Maximum Service Temperature: 150 degrees F.
    - c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
    - d. Thickness: 10 mil, 0.010 inch.
    - e. Connections: Brush on welding adhesive.
  - 3. Covering Adhesive Mastic: Compatible with insulation.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that piping has been tested before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Hot Lines with Glass Fiber Insulation:
  - 1. Pipe - Butt all side and end joints tightly and apply a brush coat of fire retardant lagging adhesive to all laps and joint strips. Seal laps, pulling jacketing tight and smooth. Self sealing laps shall be secured according to manufacturers published recommendations. Open ends of pipe insulation shall be neatly stopped off and tapered down with insulating cement and covered with canvas embedded into a wet coat of fire retardant lagging adhesive.
  - 2. Fittings - All fittings shall be insulated with segments of glass fiber pipe insulation or loops of insulating blocks firmly held in place with #16 galvanized soft wire. Cover all fitting insulation with Zeston, or equal, white plastic fitting covers.
  - 3. Valves Etc. - All valve bodies, strainers and flanges shall be insulated as specified for fittings.
- C. Cold Lines with Glass Fiber Insulation:
  - 1. Pipe - Butt all side and end joints tightly and apply a brush coat of fire retardant lagging adhesive to all laps and joint strips. Seal laps, pulling jacketing tight and smooth. Ends of pipe insulation shall be sealed with a fire retardant vapor barrier coating at all fittings and valves, and at intervals of 21 feet on continuous runs of pipe. Self sealing laps shall be secured according to manufacturers published recommendations.
  - 2. Insulation, vapor barrier and covering shall be continuous through all domestic cold water pipe supports and pipe sleeves.
  - 3. Fittings - All fittings shall be insulated with molded fiber glass fittings, segments of pipe covering, or with compressed flexible glass fiber secured in place with non-corrosive wire. All thicknesses to be equal to that of adjoining pipe covering. Cover all fitting insulation

- with Zeston, or equal, white plastic fitting covers. If batt type insulation is used, it must be a minimum of 1 pound density and 1 inch thick.
4. Valves Etc. - All valve bodies, strainers and flanges shall be insulated as specified for fittings.
- D. Apply PVC jackets with longitudinal seams and end joints overlapping at least 2 inch. Seal weather tight with manufacturers recommended sealant. Apply the jacket such that the longitudinal seam is on the bottom of pipe.
  - E. Exposed Piping: Locate insulation and cover seams in least visible locations.
  - F. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, storage tanks, pump bodies, and expansion joints.
  - G. Install insulation with factory-applied jackets with a manufacturer-approved adhesive along seams, both straight lap joints and circumferential lap joints.
    1. Inserts and Shields:
      - a. All domestic piping 1-1/2 inch and smaller, no insert is required below the insulation. Saddles shall be provided for all insulated piping. Both inserts and saddles shall be provided for all piping 2 inch and larger.
      - b. On domestic water, a pipe insulation protection saddle of 22 gauge galvanized sheet metal for piping 3 inch diameter and smaller, and 18 gauge for piping larger than 3 inch diameter, shall be provided at supports where pipe is supported by the insulation or inserts. The saddle shall be at minimum length of 12 inch.
      - c. Pipe supports for piping which operates below 250°F shall made be high density phenolic foam pipe insulation similar to Tru-Balance 2550FS saddles as manufactured by Buckaroos, Inc. Insulation in saddles shall meet ASTM E-84 ratings for 25/50 flame/smoke spread.
    2. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, see Section 07 8400.
    3. Apply a PVC jacket to all exposed piping below 8' above finished floor in ALL rooms or spaces where occupants or staff can enter.

### 3.03 SCHEDULES

- A. Plumbing system glass fiber insulation sizes:

<b>Service</b>	<b>Pipe Size</b>	<b>Insulation Thickness</b>
Cold water	1-1/4 inch and less	1/2 inch
Cold water	1-1/2 inch and greater	1 inch
Rainleaders	All sizes	1 inch
Hot water (105F to 140F)	1 inch and less	1 inch
Hot water (105F to 140F)	1-1/4 inch to 1-1/2 inch	1-1/2 inch
Hot water (105F to 140F)	2 inch and greater	2 inch
Hot water (141F to 200F)	1-1/4 inch and less	1-1/2 inch
Hot water (141F to 200F)	1-1/2 inch and greater	2 inch

- B. For piping smaller than 1-1/2 inch and located in partitions within conditioned spaces, reduction of these thicknesses by 1 inch shall be permitted, but not to a thickness less than 1".
- C. Process or treated water systems shall be insulated as indicated below:
  1. System below ambient temperatures shall be insulated as cold water piping according to table above.

2. Systems above ambient temperatures shall be insulated as hot water piping according to table above.

**END OF SECTION**

**SECTION 22 0784  
MECHANICAL FIRESTOPPING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Firestopping systems.
- B. Firestopping of all mechanical through and membrane penetrations in fire-resistance rated and smoke-resistant assemblies , whether indicated on drawings or not .

**1.02 REFERENCE STANDARDS**

- A. ASTM E 814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops; 2009.
- B. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- C. FM 4991 - Approval of Firestop Contractors; Factory Mutual Research Corporation; 2001.
- D. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.
- E. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; [www.aqmd.gov](http://www.aqmd.gov).
- F. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

**1.03 SUBMITTALS**

- A. See Division 01 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Schedule of Firestopping: List each type of penetration.
  - 2. Product Data: Provide data on product characteristics.
- C. Closeout Documents:
  - 1. Certificate from authority having jurisdiction indicating approval of materials used.

**1.04 QUALITY ASSURANCE**

- A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
  - 1. Listing in the current-year classification or certification books of UL, FM, or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
  - 2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at [www.icc-es.org](http://www.icc-es.org) will be considered as constituting an acceptable test report.
  - 3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
- B. Installer Qualifications: Company specializing in performing the work of this section and:
  - 1. Approved by Factory Mutual Research under FM Standard 4991, Approval of Firestop Contractors , or meeting any two of the following requirements:.
  - 2. With minimum 3 years documented experience installing work of this type.
  - 3. Able to show at least 5 satisfactorily completed projects of comparable size and type.
  - 4. Licensed by authority having jurisdiction.

**1.05 MOCK-UP**

- A. Install one firestopping assembly representative of each fire rating design required on project.
- B. Obtain approval of authority having jurisdiction before proceeding.
- C. If accepted, mock-up will represent minimum standard for the Work.
- D. If accepted, mock-up may remain as part of the Work. Remove and replace mock-ups not accepted.

## 1.06 SCOPE / APPLICATION

- A. Provide installed firestop protects that limit the spread of fire, heat, smoke, and gasses through otherwise unprotected openings in rated assemblies, including walls, partitions, floors, roof/ceilings, and similar locations. restoring the integrity of the fire rated construction to its original fire rating.
- B. Provide firestop systems listed for the specific combination of fire rated construction, type of penetrating item, annular space requirements, and fire rating, and the following criteria:
  - 1. F-Rating: Equal to or greater than the fire-resistance rating of the assembly in which the firestopping will be installed.
  - 2. T-Rating: In habitable areas where penetrating items are exposed to potential contact with materials on fire side(s) of rated assembly, T-rating must equal its F-rating.
  - 3. L-Rating: L-rating of 1 cfm per linear foot (5.5 cu m/h/m) maximum at ambient temperatures.
  - 4. Wall Penetrations: Systems must be symmetrical, with the same rating from both sides of the wall.

## 1.07 FIELD CONDITIONS

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. A/D Fire Protection Systems Inc: [www.adfire.com](http://www.adfire.com).
- B. 3M Fire Protection Products: [www.3m.com/firestop](http://www.3m.com/firestop).
- C. Hilti, Inc: [www.us.hilti.com](http://www.us.hilti.com).
- D. Nelson FireStop Products: [www.nelsonfirestop.com](http://www.nelsonfirestop.com).
- E. Specified Technologies, Inc: [www.stifirestop.com](http://www.stifirestop.com).
- F. Pecora Corporation: [www.pecora.com](http://www.pecora.com).
- G. Thermafiber, Inc: [www.thermafiber.com](http://www.thermafiber.com).
- H. RectorSeal: [www.rectorseal.com](http://www.rectorseal.com).
- I. International Protective Coatings Corp.

### 2.02 THROUGH PENETRATION FIRESTOP SYSTEMS

- A. Firestopping: Any material meeting requirements.
  - 1. Fire Ratings: Use any system listed by UL or tested in accordance with ASTM E 814 that has F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and that meets all other specified requirements.
  - 2. Fire Ratings: See Drawings for required systems and ratings.

### 2.03 MATERIALS

- A. Firestopping Sealants: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
- B. Cast-in-Place Devices: Firestopping device for use prior to a concrete pour. Adjustable height with pull tabs, straight edge design for close placement to walls and adjacent devices.
  - 1. Fire Resistance: For use in 1, 2, or 3 hour fire rated systems.
- C. One piece metal collar assembly encasing intumescent material for firestopping of pipes and cables through rated walls and floors.
  - 1. Fire Resistance: For use in 1 or 2 hour fire rated systems.

- D. Plastic Pipe Device: Intumescent device for firestopping of plastic pipe and cables through rated walls and floors.
  - 1. Configuration: One-piece metal collar, with locking latch and bendable tabs to secure; equipped also for conventional anchoring.
  - 2. Fire Resistance: For use in 1, 2 or 3 hour fire rated systems.
- E. Elastomeric Silicone Firestopping: Single component silicone elastomeric compound and compatible silicone sealant;
  - 1. Fire Resistance: For use in 1, 2 or 3 hour fire rated systems.
- F. Foam Firestopping: Single component silicone foam compound;
- G. Fibered Compound Firestopping: Formulated compound mixed with incombustible non-asbestos fibers;
- H. Fiber Firestopping: Mineral fiber insulation used in conjunction with elastomeric surface sealer forming airtight bond to opening;
- I. Firestop Devices - Wrap Type: Mechanical device with incombustible filler and sheet stainless steel jacket, intended to be installed after penetrating item has been installed;
- J. Firestop Devices - Cast-In Type: Sleeve and sealing material, intended to be cast in concrete floor forms or in concrete on metal deck, not requiring any additional materials to achieve penetration seal.
  - 1. Durability and Longevity: Permanent.
- K. Intumescent Putty: Compound that expands on exposure to surface heat gain.
  - 1. Fire Resistance: For use in 1, 2 or 3 hour fire rated systems.
- L. Reusable Firestopping: Removable intumescent compressible shapes, pillows, or blocks specifically tested in removable configuration;:
- M. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify openings are ready to receive the work of this section.

### **3.02 PREPARATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.
- C. Remove incompatible materials that could adversely affect bond.
- D. Install backing materials to arrest liquid material leakage.
- E. Verify that items penetrating fire rated assemblies are securely attached, including sleeves, supports, hangers, and clips.
- F. Verify that openings and adjacent areas are not obstructed by construction that would interfere with installation of firestopping, including ducts, piping, equipment, and other suspended construction.
- G. Install masking and temporary coverings as required to prevent contamination or defacement of adjacent surfaces due to firestopping installation.

### **3.03 INSTALLATION**

- A. Non-rated assemblies shall be draft stopped.
- B. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

- C. Install so that openings are completely filled and material is securely adhered.
- D. Where firestopping surface will be exposed to view, finish to a smooth, uniform surface flush with adjacent surfaces.
- E. After installation is complete, remove combustible forming materials and accessories that are not part of the listed system.
- F. Clean firestop materials off surfaces adjacent to openings as work progresses, using methods and cleaning materials approved in writing by firestop system manufacturer and which will not damage the surfaces being cleaned.
- G. Do not cover firestopping with other construction until approval of authority having jurisdiction has been received.
- H. Do not cover installed firestopping until inspected by authority having jurisdiction.
- I. Install labelling required by code.
- J. Install identification Labels for Through Penetration and Construction Joint Systems: Pressure sensitive self-adhesive vinyl labels, preprinted with the following information:
  - 1. The words "Warning - Through Penetration Firestop System - Do not Disturb. Notify Building Management of Any Damage."
  - 2. Listing agency's system number or designation.
  - 3. System manufacturer's name, address, and phone number.
  - 4. Installer's name, address, and phone number.
  - 5. General contractor's name, address, and phone number (if applicable).
  - 6. Date of installation.

#### **3.04 CLEANING**

- A. Clean firestop materials off surfaces adjacent to openings as work progresses, using methods and cleaning materials approved in writing by firestop system manufacturer and which will not damage the surfaces being cleaned
- B. Clean adjacent surfaces of firestopping materials.

#### **3.05 PROTECTION**

- A. Protect adjacent surfaces from damage by material installation.

**END OF SECTION**

**SECTION 22 1005  
PLUMBING PIPING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Sanitary waste piping, buried within 5 feet of building.
- B. Sanitary waste piping, above grade.
- C. Domestic water piping, above grade.
- D. Pipe flanges, unions, and couplings.
- E. Pipe hangers and supports.

**1.02 REFERENCE STANDARDS**

- A. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2021.
- B. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2018.
- C. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes; 2018.
- D. ASME B31.9 - Building Services Piping; 2020.
- E. ASME BPVC-IX - Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators - Welding Brazing and Fusing Qualifications; 2019.
- F. ASSE 1003 - Water Pressure Reducing Valves for Potable Water Distribution Systems; 2023.
- G. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings; 1999, with Editorial Revision (2022).
- H. ASTM B32 - Standard Specification for Solder Metal; 2020.
- I. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2020.
- J. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2020.
- K. ASTM B813 - Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube; 2016.
- L. ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings; 2016.
- M. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings; 2026.
- N. ASTM C1277 - Standard Specification for Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings; 2020.
- O. ASTM C1540 - Standard Specification for Heavy-Duty Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings; 2020.
- P. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2020 (Reapproved 2024).
- Q. ASTM D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings; 2025.
- R. ASTM D2846/D2846M - Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution Systems; 2024.
- S. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets; 2020 (Reapproved 2024).

- T. ASTM F437 - Standard Specification for Threaded Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80; 2024.
- U. ASTM F438 - Standard Specification for Socket-Type Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40; 2023.
- V. ASTM F439 - Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80; 2024.
- W. ASTM F441/F441M - Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80; 2023.
- X. ASTM F442/F442M - Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR); 2023.
- Y. ASTM F493 - Standard Specification for Solvent Cements for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe and Fittings; 2022 (Reapproved 2026).
- Z. AWWA C550 - Protective Interior Coatings for Valves and Hydrants; 2024.
- AA. AWWA C606 - Grooved and Shouldered Joints; 2015.
- BB. AWWA C651 - Disinfecting Water Mains; 2023.
- CC. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; 2021.
- DD. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; 2020.
- EE. FM 1680 - Examination Standard for Couplings Used in Hubless Cast Iron Systems for Drain, Waste or Vent, Sewer, Rainwater or Storm Drain Systems Above and Below Ground, Industrial/ Commercial and Residential; 2025.
- FF. ICC-ES AC01 - Acceptance Criteria for Expansion Anchors in Masonry Elements; 2015.
- GG. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2015.
- HH. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010.
- II. NSF 61 - Drinking Water System Components - Health Effects; 2017.
- JJ. NSF 372 - Drinking Water System Components - Lead Content; 2016.

### **1.03 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
  - 2. Welder Certificate: Include welders certification of compliance with ASME BPVC-IX.
- C. Closeout Documents:
  - 1. Project Record Documents

### **1.04 QUALITY ASSURANCE**

- A. Perform work in accordance with applicable codes.
- B. Valves: Manufacturer's name and pressure rating marked on valve body.
- C. Welding Materials and Procedures: Comply with ASME BPVC-IX and applicable state labor regulations.
- D. Welder Qualifications: Certified in accordance with ASME BPVC-IX.

### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

- B. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

## **1.06 FIELD CONDITIONS**

- A. Do not install underground piping when bedding is wet or frozen.

## **PART 2 PRODUCTS**

### **2.01 GENERAL REQUIREMENTS**

- A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

### **2.02 SANITARY WASTE PIPING, BURIED WITHIN 5 FEET OF BUILDING**

- A. PVC Pipe: ASTM D2665
  - 1. Fittings: PVC
  - 2. Joints: Solvent welded, ASTM D2665 with solvent cement

### **2.03 SANITARY WASTE PIPING, ABOVE GRADE**

- A. Cast Iron Pipe: CISPI 301, ASTM A888 hubless,.
  - 1. Fittings: Cast iron.
  - 2. Joints: ASTM C1540 neoprene gaskets heavy-duty stainless steel clamp-and-shield assemblies. For vent piping, provide neoprene gaskets with standard duty stainless steel clamp-and-shield assemblies.
- B. CPVC Pipe: ASTM D2846/D2846M, ASTM F441/F441M, or ASTM F442/F442M.
  - 1. Fittings: CPVC; ASTM D2846/D2846M, ASTM F437, ASTM F438, or ASTM F439.
  - 2. Joints: ASTM D2846/D2846M, solvent weld with ASTM F493 solvent cement.
- C. PVC Pipe: ASTM D2665. (Required to be insulated in return air plenums)
  - 1. Fittings: PVC.
  - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

### **2.04 DOMESTIC WATER PIPING, ABOVE GRADE**

- A. Copper Tube: ASTM B88, (ASTM B88M), 1 1/2 inch and smaller shall be Type L hard drawn copper. Tubing 2 inch and larger shall be Type M hard drawn copper. Soft drawn copper tubing in small sizes may be used adjacent to fixtures and equipment.
  - 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
  - 2. Joints: ASTM B32, alloy Sn95 solder.
  - 3. Mechanical Press Sealed Fittings: Double-pressed type, NSF 61 and NSF 372 approved or certified, utilizing EPDM, nontoxic, synthetic rubber sealing elements.
    - a. Manufacturers:
      - 1) Apollo Valves: [www.apollovalves.com/#sle](http://www.apollovalves.com/#sle).
      - 2) Viega LLC: [www.viega.com](http://www.viega.com).
      - 3) Nibco
      - 4) Milwaukee
      - 5) Substitutions: See Section 01 6000 - Product Requirements.

### **2.05 PIPE FLANGES, UNIONS, AND COUPLINGS**

- A. Unions for Pipe Sizes 3 inch and Under:
  - 1. Copper Tube and Pipe: Class 150 bronze unions with soldered joints.
- B. Flanges for Pipe Sizes Over 1 inch:
  - 1. Copper Tube and Pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.
- C. Mechanical Couplings for Grooved and Shouldered Joints: Two or more curved housing segments with continuous key to engage pipe groove, circular C-profile gasket, and bolts to secure and compress gasket.
  - 1. Dimensions and Testing: In accordance with AWWA C606.

2. Housing Material: Provide ASTM A47/A47M malleable iron or ductile iron, galvanized.
  3. Gasket Material: EPDM suitable for operating temperature range from minus 30 degrees F to 230 degrees F.
  4. Bolts and Nuts: Hot dipped galvanized or zinc-electroplated steel.
  5. When pipe is field grooved, provide coupling manufacturer's grooving tools.
  6. Manufacturers:
    - a. Victaulic - Style 606.
    - b. Substitutions: See Section 01 6000 - Product Requirements.
- D. No-Hub Couplings (Sanitary Vent Piping Only):
1. Testing: In accordance with ASTM C1277 and CISPI 310.
  2. Gasket Material: Neoprene complying with ASTM C564.
  3. Clamp: Type 304 Stainless Steel.
  4. Band Material: Type 304 Corrugated Stainless steel (0.010-inch thick).
  5. Screw Material: Type 305 or 304L Stainless steel (5/16").
  6. Manufacturers:
    - a. Husky SD-2000.
    - b. Substitutions: See Section 01 6000 - Product Requirements.
- E. Shielded, Heavy Duty No-Hub Couplings:
1. Testing: In accordance with ASTM C1540 and FM 1680.
  2. Gasket Material: Neoprene complying with ASTM C564.
  3. Clamp: Type 304 Stainless Steel.
  4. Band Material: Type 304 Corrugated Stainless steel (0.015-inch thick).
  5. Screw Material: Type 305 or 304L Stainless steel (3/8").
  6. Manufacturers:
    - a. Husky SD-4000.
    - b. Substitutions: See Section 01 6000 - Product Requirements.
- F. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

## **2.06 PIPE HANGERS AND SUPPORTS**

1. Manufacturers:
    - a. Anvil
    - b. Erico-Caddy
    - c. Substitutions: See Section 01 60 00 - Product Requirements.
  2. Hangers and strut located in corrosive areas shall be type 316 stainless steel with stainless steel hardware.
  3. Hangers for all piping shall be oversized to encircle the piping and the insulation, the insulation shall be continuous through all hangers.
    - 1) Cold and Hot Pipe Sizes 6 inch and Larger: Double hangers.
  - b. Floor Supports: Concrete pier or steel pedestal with floor flange; fixture attachment.
- B. Plumbing Piping - Drain, Waste, and Vent:
1. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inches: Carbon steel, adjustable swivel, split ring.
  2. Hangers for Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.
  3. Hanger Rods: Zinc-plated steel, threaded both ends, threaded one end, or continuous threaded.
  4. Wall Support for Pipe Sizes to 3 inch: Cast iron hook.
  5. Wall Support for Pipe Sizes 4 inch and Over: Welded steel bracket and wrought steel clamp.
  6. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

7. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- C. Plumbing Piping - Water:
1. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inches: Carbon steel, adjustable swivel, split ring.
  2. Hangers for Cold Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.
  3. Hangers for Hot Pipe Sizes 2 to 4 inch: Carbon steel, adjustable, clevis.
  4. Hangers for Hot Pipe Sizes 6 inch and Larger: Adjustable steel yoke, cast iron pipe roll, double hanger.
  5. Hanger Rods: Zinc-plated steel, threaded both ends, threaded one end, or continuous threaded.
  6. Wall Support for Pipe Sizes Up to 3 inch: Cast iron hook.
  7. Wall Support for Pipe Sizes 4 inch and Larger: Welded steel bracket and wrought steel clamp.
  8. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
  9. Floor Support for Hot Pipe Sizes to 4 inch: Cast iron adjustable pipe saddle, locknut, nipple, floor flange, and concrete pier or steel support.
  10. Copper Pipe Support: Carbon steel ring, adjustable, copper plated for uninsulated copper pipe.
- D. Hanger Fasteners: Attach hangers to structure using appropriate fasteners, as follows:
1. Concrete Wedge Expansion Anchors: Comply with ICC-ES AC193.
  2. Masonry Wedge Expansion Anchors: Comply with ICC-ES AC01.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that excavations are to required grade, dry, and not over-excavated.

### **3.02 PREPARATION**

- A. Remove scale and dirt, on inside and outside, before assembly.
- B. Prepare piping connections to equipment with flanges or unions.

### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. The contractor shall note plastic pipe is not allowed above the ceilings in any areas that are used as ventilation air plenums (i.e. return, supply, exhaust, etc.).
- C. Plastic DWV piping shall be installed as addressed by IAPMO (UPC) section on Expansion and Contraction. Any straight runs of plastic DWV piping exceeding 30 feet shall be installed to accommodate thermal expansion.
- D. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- E. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- F. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- G. Group piping whenever practical at common elevations.
- H. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. See Section 22 0516.
- I. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
  1. See Section 22 0719.
- J. Provide access where valves and fittings are not exposed.

1. Coordinate size and location of access doors with Section 08 3100.
- K. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc-rich primer to welding.
- L. Prepare exposed, unfinished pipe, fittings, supports, and accessories for finish painting.
  1. All exposed gas piping outdoors shall be cleaned of all dirt, grease and oil, painted with one coat primer and two coats enamel of a color to be selected by the architect. If steel piping is used, a second option shall be galvanized in lieu of painting.
- M. Excavation, Trenching, and Backfilling
  1. Excavation and Trenching: The bottom of trenches shall be tamped hard and graded to secure required fall. Bell holes shall be excavated so that pipe shall rest on solid ground for its entire length. Rock, where encountered, shall be excavated to a depth of six (6) inches below the bottom of the pipe, and before pipe is laid, the space between the bottom of the pipe and the rock surface shall be filled with gravel. All surplus excavating materials shall be removed from the job site to location directed by the Architect.
  2. Filling and Backfilling - Interior: At areas below concrete floor slab on ground, a sandy loam backfill shall be placed in 6" layers and thoroughly compacted by approved means at optimum moisture to a density of 95% or Standard Proctor Density. Sandy loam fill shall contain not more than 10% of clay and/or silt. Fill shall not contain gravel particles larger than 1/2". Material for backfill shall be approved by Architect and by an approved testing laboratory.
  3. Tests shall be made at expense of the Contractor by an approved testing laboratory, to determine adequacy of compaction. These tests shall be made during the compaction operation at various levels to insure uniformity of compaction and test reports shall show elevation as well as location of tests. The testing laboratory inspector shall be on the site at intervals during all major backfilling operations. Compaction tests shall be made at locations as directed by Architect.
  4. Cracked and/or damaged floor slabs, walls or partitions resulting from improper compaction of fill materials shall be repaired or replaced, as directed by Architect, at the Contractor's expense.
- N. Install valves with stems upright or horizontal, not inverted. See Section 22 0523.
- O. Install water piping to ASME B31.9.
- P. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813; in potable water systems use flux also complying with NSF 61 and NSF 372.
- Q. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.
- R. Sleeve pipes passing through partitions, walls, and floors.
- S. Inserts:
  1. Provide inserts for placement in concrete formwork.
  2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
  3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
  4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
  5. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut above slab.
- T. Pipe Hangers and Supports:
  1. Install in accordance with ASME B31.9.
  2. Support horizontal piping as per local plumbing codes.
  3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.

4. Place hangers within 12 inches of each horizontal elbow.
  5. Hangers shall not be placed on couplings.
  6. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
  7. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
  8. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
  9. Provide copper plated hangers and supports for copper piping.
  10. Provide stainless steel hangers and rods for piping installed in corrosive environments (ie. swimming pools, green houses, etc.).
  11. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
    - a. Painting of interior plumbing systems and components is specified in Section 09 9123.
    - b. Painting of exterior plumbing systems and components is specified in Section 09 9113.
  12. Provide hangers adjacent to motor-driven equipment with vibration isolation; see Section 22 0548.
  13. Support cast iron drainage piping at every joint within 18 inches.
  14. All hangers shall be oversized to encircle the piping and the insulation. Insulation shall be continuous through all hangers.
- U. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

### **3.04 APPLICATION**

- A. Use grooved mechanical couplings and fasteners only in accessible locations.
- B. Install unions downstream of valves and at equipment or apparatus connections.
- C. Provide spring-loaded check valves on discharge of water pumps.
- D. Provide flow controls in water recirculating systems where indicated.
- E. Piping installed in ventilation plenums
  1. In all cases, product and piping assembly shall meet flame spread index and smoke developed index of 25/50
  2. Cast Iron
  3. CPVC

### **3.05 TOLERANCES**

- A. Drainage Piping: Establish invert elevations within 1/2 inch vertically of location indicated and slope to drain at minimum of 1/4 inch per foot slope.

### **3.06 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM**

- A. Disinfect water distribution system in accordance with Section 33 0110.58.
- B. Prior to starting work, verify system is complete, flushed, and clean.
- C. Inject disinfectant, free chlorine in liquid, powder, tablet, or gas form throughout system to obtain 50 to 80 mg/L residual.
- D. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
- E. Maintain disinfectant in system for 24 hours.
- F. If final disinfectant residual tests less than 25 mg/L, repeat treatment.

- G. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
- H. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

**END OF SECTION**

**SECTION 22 1006  
PLUMBING PIPING SPECIALTIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Drains.

**1.02 REFERENCE STANDARDS**

- A. ASME A112.6.3 - Floor Drains; 2022.
- B. NSF 61 - Drinking Water System Components - Health Effects; 2017.
- C. NSF 372 - Drinking Water System Components - Lead Content; 2016.

**1.03 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
  - 2. SIndicate dimensions, weights, and placement of openings and holes.
  - 3. Certificates: Certify that grease interceptors meet or exceed specified requirements.
- C. Closeout Documents:
  - 1. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.
- D. Project Record Documents: Record actual locations of equipment, cleanouts, backflow preventers, and water hammer arrestors.

**1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years documented experience.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Accept specialties on site in original factory packaging. Inspect for damage.

**PART 2 PRODUCTS**

**2.01 GENERAL REQUIREMENTS**

- A. Specialties in Potable Water Supply Systems: Provide products that comply with NSF 61 and NSF 372 for maximum lead content.

**2.02 DRAINS**

- A. Manufacturers:
  - 1. Jay R. Smith Manufacturing Company: [www.jayrsmith.com](http://www.jayrsmith.com).
  - 2. Josam Company: [www.josam.com](http://www.josam.com).
  - 3. MIFAB, Inc: [www.mifab.com/#sle](http://www.mifab.com/#sle).
  - 4. Zurn Industries, LLC: [www.zurn.com](http://www.zurn.com).
  - 5. Watts
  - 6. Wade
  - 7. Substitutions: See Section 01 6000 - Product Requirements.
- B. Floor Drain FD:
  - 1. ASME A112.6.3; lacquered cast iron or stainless steel, two piece body with double drainage flange, weep holes, reversible clamping collar, square adjustable nickel-bronze strainer and separate deep seal trap.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.
- C. Install floor cleanouts at elevation to accommodate finished floor.
- D. Where required by code, a cleanout shall be installed above the fixture connection fitting, serving each urinal, regardless of the location of the urinal in the building. Coordinate exact location of each cleanout with the Architect.
- E. Install approved potable water protection devices on plumbing lines where contamination of domestic water may occur; on boiler feed water lines, janitor rooms, fire sprinkler systems, premise isolation, irrigation systems, flush valves, interior and exterior hose bibbs.
- F. Building sewers shall have cleanouts not more than 75' apart for 4" pipe and not more than 100' apart for larger pipe.
- G. Provide a cleanout at the connection point of new and existing systems to allow for the testing of all new piping systems. Additional building cleanouts shall be installed at each horizontal change in direction exceeding 135-degrees.

**END OF SECTION**

**SECTION 22 4000  
PLUMBING FIXTURES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Tank type water closets.
- B. Lavatories.

**1.02 REFERENCE STANDARDS**

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASHRAE Std 18 - Methods of Testing for Rating Drinking-Water Coolers with Self-Contained Mechanical Refrigeration; 2008 (Reaffirmed 2013).
- C. ASME A112.6.1M - Floor-Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use; 1997 (Reaffirmed 2017).
- D. ASME A112.18.1 - Plumbing Supply Fittings; 2024.
- E. ASME A112.19.3 - Stainless Steel Plumbing Fixtures; 2022.
- F. ASME A112.19.5 - Flush Valves and Spuds for Water Closets, Urinals, and Tanks; 2022.
- G. ASSE 1014 - Performance Requirements for Backflow Prevention Devices for Hand-Held Showers; 2020.
- H. ASSE 1070 - Performance Requirements for Water Temperature Limiting Devices; 2020.
- I. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- J. NSF 61 - Drinking Water System Components - Health Effects; 2017.
- K. NSF 372 - Drinking Water System Components - Lead Content; 2016.

**1.03 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.
- C. Closeout Documents:
  - 1. Manufacturer's Instructions: Indicate installation methods and procedures.
  - 2. Maintenance Data: Include fixture trim exploded view and replacement parts lists.
  - 3. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

**1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

**1.05 REGULATORY REQUIREMENTS**

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Accept fixtures on-site in factory packaging. Inspect for damage.
- B. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

**1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

- B. Provide five year manufacturer warranty for electric water cooler.

## **PART 2 PRODUCTS**

### **2.01 GENERAL REQUIREMENTS**

- A. Potable Water Systems: Provide plumbing fittings and faucets that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.
- B. This Contractor shall submit a portfolio showing fixtures and trimmings to the Architect for his approval.

### **2.02 FIXTURE SUPPORT AND FASTENINGS**

- A. All fixtures shall be securely anchored independent of finished wall.
- B. Fastening to masonry walls shall be by brass bolts or machine screws in lead sleeve type anchorage units, or 1/4 inch brass expansion bolts of sufficient length to extend at least 3 inches into solid masonry.
- C. Fastening to wood partitions shall be by the use of round head brass wood screws. Wood screws shall go into solid wood, such as wood inserts, floor joists, studs, or 2" x 6" set between studs.
- D. Fixture fastening with steel stud partitions shall be done by bolting or welding a 3/8" x 6" wide steel plate to studs and extending the plate one stud beyond the first and last fixture mounting points or provide an equivalent rigid mounting frame in wall. Fixture carriers shall be provided where noted.
- E. All water supply pipe stubs through walls to shower heads and to flush valves shall be securely anchored within the wall or plumbing space.

### **2.03 ACCESSORIES**

- A. Carriers:
  - 1. See Fixtures
- B. Stops
  - 1. Manufacturers:
    - a. Brass Craft
    - b. McGuire
    - c. Substitutions: See Section 01 60 00-Product Requirements.
  - 2. Faucet, stop valves, traps, etc., shall be heavy cast brass. Water lines to all individual fixtures shall be equipped with high grade chromium plated brass compression stop valves. Each individual fixture shall be provided with valves on the supply line.
    - a. Stop valves: Brass Craft KTCR19X C, 1/4 turn ball valve, chrome plated, with Tee handle.

### **2.04 MANUFACTURERS**

- A. China Fixtures
  - 1. American Standard, Kohler, Sloan, Zurn Commercial or approved equal.
- B. Fixture Carriers
  - 1. Josam, Wade, Smith, Zurn, Watts or approved equal.
- C. Lavatory Trim:
  - 1. American Standard, Kohler, T & S Brass, Chicago Faucet, Moen Commercial, Zurn Commercial, Delta, Acorn, Hydrotek, or approved equal.
- D. Sink Trim:
  - 1. American Standard, Kohler, T & S Brass, Chicago Faucet, Moen Commercial, Zurn Commercial, Delta, Acorn or approved equal.
- E. Seats:

1. Bemis, Olsonite, Beneke, Church, Toto or approved equal.
- F. Sinks:
1. Elkay, Just, or approved equal.
- G. Thermostatic Mixing Valves:
1. Leonard, Lawler, Caleffi, Watts Regulator, Powers, or approved equal.
- H. Trap Wraps:
1. Brocar, Truebro, Plumberex, Lav-Guard, Proflo or an approved equal.

## 2.05 FIXTURES

- A. NSF International certified sinks shall be used in all food prep areas.
- B. L-1, Lavatory:
1. Lavatory: Kohler Greenwich K-2032, Wall hung, Vitreous china, with back, anti-splash rim, arm support carrier.
  2. Trim: T&S Brass #B-2711, centerset lavatory faucet with integral spout, 2.2 gpm, ceramic disk cartridge, single lever control with aerator, perforated strainer, 1-1/4" brass tailpiece.
  3. Thermostatic Mixing Valve: Leonard 170D-LF-BRKT Lead Free, ASSE 1070 Certified, bronze body point of use mixing valve with 3/8" inlet and outlet compression connections with cold water by-pass, inlet check valves with stainless steel screen, and mounting bracket.
  4. Supplies: 3/8" angle supplies flexible tube riser, brass stops, chromed finish.
  5. Trap: 1-1/4" adjustable cast brass "P" trap.
  6. Size: 20 1/2" x 18 1/4"
  7. Arm Support Carrier: Smith #0700 or equal.
  8. Trap Guard: Truebro Lav Guard 2, P-trap and wall supplies insulation kit.
  9. Mounting: Refer to Architectural wall section for mounting height.
- C. WC-1, Water Closet:
1. Closet: Kohler Highline K-3979, Floor mounted, Tank type, vitreous china, Siphon jet, elongated bowl, 2-1/8" fully glazed trapway, 16-1/2" floor to rim, bolt caps, 1.6 gallon flush. Trip lever shall be provided on the accessible side of the closet in accordance with ADA requirements. Refer to drawings to determine which closets shall be RH and which shall be LH.
  2. Seat: Bemis 1955SSCT white solid plastic, check hinge, self-sustaining, stainless steel hinge posts, open front, less cover.
- D. WC-2, Water Closet:
1. Closet: American Standard Baby Devoro 2315.016, Floor Mounted, Tank Type, vitreous china, Siphon jet, fully glazed trapway, elongated bowl, bolt caps, 10-1/4" floor to rim, 1.28 gallon.
  2. Seat: Bemis BB955SSCT white solid plastic, check hinge, self-sustaining, stainless steel hinge posts, open front less cover.
- E. S-1, Sink:
1. Sink: Elkay LRAD221950, handicapped depth, countertop, single compartment, centered rear drain outlet, type 304, 18-8 stainless steel, 18 gauge, self-rimming, back ledge.
  2. Trim: T&S Brass B-2866-08 with 8" gooseneck spout, wristblade handles, aerator, LK-35 stainless steel basket strainer.
  3. Trap: Chrome plated cast brass "P" trap.
  4. Supplies: 3/8" angle supplies with flexible tube riser, brass stops, chromed finish.
  5. Size: 22" x 19-1/2" with 18" x 14" x 5" bowl
  6. Trap Guard: Truebro Lav Guard Model 102 E-Z, P-trap and wall supplies insulation kit.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.
- B. Verify that electric power is available and of the correct characteristics.
- C. Confirm that millwork is constructed with adequate provision for the installation of counter top lavatories and sinks.

### **3.02 PREPARATION**

- A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

### **3.03 INSTALLATION**

- A. Install each fixture with trap, easily removable for servicing and cleaning.
- B. Provide chrome plated rigid or flexible supplies to fixtures with handle stops, reducers, and escutcheons.
- C. Install components level and plumb.
- D. Install and secure fixtures in place with wall carriers and bolts.
- E. Solidly attach water closets to floor with lag screws. Lead flashing is not intended to hold fixture in place.
- F. Where fixtures come in contact with floor or wall, joint shall be sealed with silicone caulking of color to match fixture.
- G. Provide stainless steel wall escutcheon on waste pipe through the wall for lavatories and sinks.
- H. For all flush valves installed in ADA installations, coordinate space for service of flush valve with grab bars.
- I. For connection to residential dishwasher, provide stainless steel braided hose from stop valve to dishwasher connection.

### **3.04 INTERFACE WITH WORK OF OTHER SECTIONS**

- A. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.

### **3.05 ADJUSTING**

- A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.
- B. Adjust wristblade handles on all sinks and lavatories to be rotated 22.5-degree forward.

### **3.06 CLEANING**

- A. Clean plumbing fixtures and equipment.

### **3.07 PROTECTION**

- A. Protect installed products from damage due to subsequent construction operations.
- B. Do not permit use of fixtures by construction personnel.
- C. Repair or replace damaged products before Date of Substantial Completion.

**END OF SECTION**

**SECTION 23 0060  
MECHANICAL DEMOLITION**

**PART 1 GENERAL**

**1.01 DESCRIPTION**

- A. Contract documents and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections apply to this section.
- B. This section specifies the demolition and removal of all HVAC equipment and distribution conduits including but not limited to ductwork, piping, controls, insulation, and accessories in existing building.
- C. Unless otherwise noted in the Documents, all salvage items removed in connection with this Contract are to become the property of the Contractor, however the Owner shall have the first right of refusal on all equipment removed.

**1.02 SUBMITTALS**

- A. Proposed Dust Control and Noise Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate.
- B. Schedule of selective demolition activities:
  - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
  - 2. Interruption of building utility services.
  - 3. Coordination for shutoff, capping and continuation of services.
  - 4. Coordination of Owner's continued occupancy of portions of existing building and of Owner's occupancy of completed work.
- C. Pre-demolition photographs or videotape showing existing pre-demolition conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by selective demolition operations. Submit before demolition work begins.

**1.03 PROJECT CONDITIONS**

- A. Owner will occupy portions of the building immediately adjacent to selective demolition area. Conduct demolition so Owner's operation will not be disturbed. Provide not less than 48-hour notice to Owner of activities that will affect the Owner's operations.
- B. Maintain existing services to Owner occupied areas during demolition if possible or coordinate interruption of services prior to demolition.
- C. Owner assumes no responsibility for condition of area to be selectively demolished.
- D. Hazardous Materials:
  - 1. It is not expected that hazardous materials will be encountered in the Work.

**PART 2 PRODUCTS**

**2.01 MATERIALS AND EQUIPMENT**

- A. Materials and equipment for patching and extending work: As specified in individual Sections.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify field measurements and existing ductwork and piping arrangements are as shown on Drawings.
- B. Verify that abandoned equipment serves only abandoned facilities.

- C. Demolition drawings are based on casual field observation and existing record documents. The demolition Drawings are diagrammatic and show the general scope of demolition work and do not show all the construction detail of the original record drawings. Report discrepancies to the Project Engineer before disturbing existing installation.
- D. The Contractor shall visit the existing building and grounds and review the existing building record drawings for details of existing installation to familiarize themselves with existing conditions prior to submitting bid. No allowance will be made subsequently, in this connection, on behalf of the Contractor for any error or negligence on his part.
- E. Beginning of demolition means the Contractor accepts existing conditions.

### **3.02 PREPARATION**

- A. Disconnect mechanical systems in areas scheduled for removal. Notify Project Engineer and Owner of areas to be affected by mechanical demolition work prior to commencing.

### **3.03 SELECTIVE DEMOLITION AND EXTENSION OF EXISTING MECHANICAL WORK**

- A. Demolish and remove from site and extend existing mechanical work under provisions of this Division and as indicated on the Drawings unless otherwise noted.
- B. Salvage items noted to remain the property of the Owner shall be delivered to a location to be designated by the Owner. Contractor shall remove from construction areas all trash or debris as it accumulates and dispose of it off site at no additional cost to the Owner. All construction areas shall be kept clean, safe, and orderly at all times. At the completion and acceptance for work, Contractor shall remove from the site all debris and surplus materials resulting from this work and dispose of them off site at no additional cost to the Owner.
- C. Do not use cutting torches until work area is clear of flammable materials. At concealed spaces verify condition and contents of hidden space before starting flame cutting operations. Maintain Fire Watch and portable fire-suppression devices during flame-cutting operations. Maintain and evaluate ventilation during flame-cutting operations.
- D. Maintain ventilation for dust control during selective demolition process. Verify Owner requirements for dust control and conform to their standards for all demolition activities.
- E. Remove, relocate, and extend existing installations to accommodate new construction as required for proper installation and system operation.
- F. Remove all accessories above grade. When removing equipment or terminal devices all associated pipe, duct, ATC devices, wiring, etc. shall be removed and capped as required. Cut piping, duct, tubing, etc. behind walls, above ceilings and below floors, and patch surfaces to match existing conditions. Finishes will be by others unless otherwise noted in documents.
- G. Neatly cut openings and holes plumb, square and true to dimension required. Use cutting methods least likely to damage construction to remain or adjoining construction. Cut and drill from exposed surfaces into concealed surfaces to avoid marring or spalling of finished surfaces. Temporarily cover openings to remain.
- H. Patch all openings created by removal of mechanical equipment, ATC devices, ducts, pipes, etc. unless noted as being patched by others. Openings to be patched to match existing with similar materials and finish unless otherwise noted.
- I. Seal all existing roof penetrations, which will not be reused. Roof patching shall be by project roofing contractor, or an Owner approved roofing contractor.
- J. Remove, relocate, or provide brackets, hangers, and other accessories as required.
- K. Repair adjacent construction and finishes damaged during demolition and extension work.
- L. Maintain access to existing mechanical installations, which remain active.

### **3.04 SALVAGE**

- A. All items removed from existing building shall be salvaged in a workmanlike manner.

- B. The handling, storage, and disposition of salvage materials shall be as directed by the Architect. Generally, all salvage material shall remain the property of the Owner. Materials and equipment not wanted by Owner shall be removed from the job site and become the property of the contractor.

**3.05 CLEAN AND REPAIR**

- A. Clean and repair existing materials and equipment, which remain or are to be returned to the Owner.
- B. All building surfaces damaged and openings left by new Work or the removal or relocation of mechanical equipment, piping, etc., shall be repaired to original condition and painted by the Contractor.

**END OF SECTION**

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**SECTION 23 0100  
MECHANICAL GENERAL REQUIREMENTS**

**PART 1 GENERAL**

**1.01 APPLICABILITY**

- A. This section applies to and forms a part of each of the sections of Division 23. This section, and each of the sections to which it applies, is subject to the requirements of the Instructions to Bidders, General Conditions, and Special Conditions of these complete specifications.
- B. The work covered by this Division of the Specifications consists of furnishing all labor, supervision, equipment, materials, all incidentals, related items, and appurtenances, and performing all operations necessary to complete the installation of work in strict accordance with these specifications and drawings.
- C. All work shall be finished, tested and ready for operation.

**1.02 DEFINITIONS**

- A. Words "Material" or "Furnish" where written in Division 23 specifications and drawings shall mean any and all apparatus, equipment, devices, fixtures, components, products, assemblies, items, parts, things, and any other pieces specified or shown or required.
- B. Words "Labor" or "Install" where written in Division 23 specifications and drawings shall mean any and all physical effort, manpower, time, expertise, tools, equipment and services to carefully assemble, install and affix all material in a proper, complete and acceptable manner.
- C. Word "Provide" where written in Division 23 specifications and drawings shall mean "Mechanical Contractor shall furnish all labor and material and completely and properly install such material and leave same in acceptable condition and intended acceptable working order".

**1.03 DISCREPANCIES OR OMISSIONS FROM DRAWINGS OR DOCUMENTS**

- A. Notify the Engineer of any discrepancies in, or omissions from the drawings or documents. Neither the Owner nor the Architect will be responsible for any oral instructions or modifications of the specifications or drawings. Written interpretations will be made only by Addenda.
- B. If discrepancies are not reported, the contractor shall bid the greater quantity or better quality (highest dollar value), and appropriate adjustment will be made after contract award.
- C. Discrepancies discovered during construction shall immediately be called to the attention of the Architect/Engineer for clarification.
- D. All minor items necessary for the completion and successful operation of the system, whether or not herein definitely specified or indicated on the drawings, shall be furnished and installed.
- E. Omission of/or express reference to any material necessary for/or reasonably incidental to complete installation shall not release Contractor from providing such material. Where material is shown on drawings but is not specified or is specified but not shown, such material shall be considered both shown and specified.
- F. Any work not clear to Contractor shall be referred to Engineer for clarification before bid is submitted. If no question is raised prior to opening of bid, Contractor shall be required to provide work in question as directed by Engineer, whose decision is final, without additional charges.
- G. By virtue of submitting a bid, Contractor agrees that they are skilled and experienced in use of and in interpretation of drawings and specifications. Contractor further agrees that they have carefully reviewed all drawings, all specifications, and all addenda, which constitute bid documents for this contract, and finds them free of ambiguities and good and sufficient for bidding and construction purposes.

#### **1.04 DRAWINGS**

- A. The drawings indicate the extent and general layout of the mechanical systems intended for the building. Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings, connections, and accessories which may be required. Furnish offsets, fittings, valves, and accessories as may be required, to produce a complete and operating installation of type shown and specified.
- B. All piping and ductwork shall be routed so as not to obstruct access to other equipment (i.e. VAV box controls, electrical devices, fire alarm devices, etc.). Routing indicated on drawings is representative of intended location but shall be field verified. It shall be this contractor's responsibility to coordinate with other trades for accessibility.
- C. Any work or system on the roof not explicitly indicated on the roof plan shall be approved by the engineer prior to installing.
- D. In general, the mechanical equipment drawings are drawn to scale as noted. Obtain dimensions and locations of partitions, walls, etc., from the Architectural drawings wherever possible and do not scale the mechanical drawings. Consult the Architectural drawings for details of construction, location of suspended ceilings, ceiling heights, and other pertinent information. Architect's drawings shall not take precedence over field measurements.
- E. All drawings and specifications shall be considered in bidding. The drawings and specifications are complimentary, and what is called for in either of these shall be as binding as though called for by both. Should any conflict arise between drawings and specifications, such conflict shall be brought to the attention of the Architect.

#### **1.05 SITE INSPECTION**

- A. Before submitting a proposal for the work contemplated in these specifications and accompanying drawings, each bidder shall examine the site and familiarize themselves with all the existing conditions and limitations, including the extent of demolition, cutting, and patching to be done by the Contractor for Mechanical Work. No extras will be allowed because of the Contractor's misunderstanding as to the amount of work involved, or his lack of knowledge of any condition in connection with the work.

#### **1.06 PRIOR APPROVAL REQUESTS**

- A. Where the Bid Documents stipulate a particular Product, substitutions will be considered by the Engineer up to 10 days before receipt of bids.
- B. The submission shall provide complete information, test, etc. relating to quality, performance, suitability, to determine acceptability of such products.
- C. When a request to substitute a Product is made, the Engineer may approve the substitution and will issue an Addendum to known bidders.
- D. Provide Products as specified unless substitutions are submitted in this manner and subsequently accepted.
- E. The cost of any changes of other trades as a result of use of the substitution material or equipment must be borne by the Contractor submitting such material or equipment.

#### **1.07 REVIEW OF MECHANICAL MATERIALS AND EQUIPMENT**

- A. Within thirty (30) days after award of construction contracts, Contractor shall submit for acceptance to the Architect quantity of shop drawings specified for the equipment indicated in these specifications. The shop drawings shall include the equipment manufacturer's name and address, catalog designation or model number, rough-in data & dimensions, performance curves and rated capacities & operational characteristics.
- B. The Contractor shall thoroughly review each item for compliance with these Specifications making any necessary corrections prior to submittal. Each shop drawing set shall be stamped,

signed, and dated indicating Contractor review and submitted electronically via PDF file format. The PDF file name shall include the relevant specification section number for reference. If the Contractor fails to properly review shop drawings, the Contractor shall reimburse the Engineer for all additional reviews on a time and material basis.

- C. Provide samples of materials or equipment proposed to be furnished, if requested. Samples shall become the property of the Architect/Engineer and will be returned only when accompanied by a written request to do so.
- D. None of the items listed shall be purchased, delivered to the site, or installed, until the item is reviewed. No substitution will be permitted after review except where such substitution is considered by the Architect to be in the best interest of the Owner.
- E. The Engineer will review all Shop Drawings submitted and will retain a copy for record file.
- F. Approval Stamp: This review is to verify general conformance with the design concept of the Project and substantial compliance with the information provided in the Contract Documents. This review does not in any way relieve the Contractor or their suppliers of their responsibility to provide all materials and equipment as specified, in quantities, quality and dimensions required. Submittals will be reviewed with the following actions:
  - 1. "No Exception Noted" indicates that the Submittal appears to conform to the design concept of the Work and that the Contractor, at their discretion, may proceed with fabrication and/or procurement and installation.
  - 2. "Make Corrections Noted" indicates that the Submittal, after noted corrections are made, appears to conform to the design concept of the Work and that the Contractor, at their discretion, may proceed with fabrication and/or procurement and installation, if the corrections are accepted by the Contractor without any increase in Contract Sum or Time.
  - 3. "Revised and Resubmit" indicates that the noted revisions are such that a corrected copy of the Submittal is required for review to confirm that the noted revisions have been understood and made. The Contractor, at their discretion, may proceed with fabrication and/or procurement and installation after submitting a corrected copy and verifying with the reviewer that the corrected copy is acceptable, if the corrections are accepted by the Contractor without an increase in the Contract Sum or Time.
  - 4. "Rejected" indicates that the Submittal does not appear to conform to the specifications, a resubmission is required, and fabrication or procurement is not authorized.
- G. If the Engineer rejects (Revised and Resubmit or Rejected) the same section two times the engineer shall be compensated for additional reviews. Any subsequent submittal will require the inclusion of a check made out to the engineer in the amount of \$500.00. Contractor is responsible for all delays caused by the resubmittal process.
- H. Should the contractor fail to comply with any of the requirements of the preceding subparagraphs; then the right is reserved by the Architect to select any or all items in the material schedule, with that selection to be final and binding upon the contractor. The materials selected or reviewed, as the case may be, by the Architect, shall be used in the work at no additional cost to the Owner.
- I. Connections and equipment clearances are based on the manufacturer scheduled. Any deviations in size, weight, and/or configuration shall be the responsibility of the contractor. Equipment by other approved manufacturers will be acceptable if of a similar type and grade and if of approximately the same general overall dimensions. Quality, construction and performance must be equal to or better than that specified.
- J. When the contractor chooses to furnish any reviewed material or equipment that requires electrical specifications/connections (circuit breaker, conduit, wire, labor, etc.) different than shown and/or scheduled on the drawings, or specified in detail, the contractor shall be responsible for coordinating any necessary changes and shall bear the cost of such changes (including engineering costs).

1. Submit detailed documentation of all required changes, confirmation of coordination with the Electrical Contractor, and an estimated cost breakdown prior to ordering.
- K. All contractor requested changes from the design, including size, weight, configuration, and electrical modifications, must be submitted for review and proof of coordination prior to approval.

#### **1.08 PROPOSAL REQUESTS AND INSTRUCTIONS**

- A. For any proposal request or instruction that requires an adjustment to the Contract Sum, submit an itemized quotation for the change(s) described in the proposed modifications to the Contract Documents. Proposal shall also indicate credits, deducts, and/or offsets for material and labor originally included in contract.
1. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. Breakdown shall include amounts, lengths, quantities, types, sizes, etc. of material.
  2. Indicate applicable taxes, O&P, delivery charges, equipment rental, and other incidental charges.
  3. Include costs of labor and supervision directly attributable to the change.
  4. All sub-contractor pricing shall include the same breakdown as described above.

#### **1.09 WARRANTY**

- A. All equipment and installation shall be provided with a 1-year warranty beginning with substantial completion.
- B. Refer to individual spec sections for specific warranty information that is different than stated above.
- C. Submit warranty with related forms completed in Owner's name and registered with manufacturer.

#### **1.10 MANUALS**

- A. In addition to catalog data and shop drawings submitted for review, this contractor shall furnish Operation and Maintenance Manuals for the mechanical systems. Manuals shall be delivered to the Architect before final observation of the work.
- B. Operation and Maintenance Manuals shall be furnished in PDF electronic format as well as two (2) copies bound in new hard backed 3 ring binders with the title "Operations and Maintenance Manuals" and the project title clearly printed on the front cover and side of binder .
- C. Provide an index at the beginning of the manual for the sections included in the manual. Material shall be listed in specification sequence order.
- D. All sections in hard copy manuals shall be referenced with plastic tabs.
- E. Operation and Maintenance Manuals shall contain:
1. Approved shop drawings clearly showing the models, sizes and capacities of equipment used.
  2. Manufacturer's operating, parts list, maintenance, installation, lubrication and cleaning instructions.
  3. Valve tag list.
  4. Name and address of authorized service organization and parts depot.
  5. A description of how the components of a given HVAC system interact within the large system. For example, circulating pumps, boilers, unit heaters are part of the "heating system".
  6. A description of normal operating conditions for the system and its components.
  7. A description of common symptoms of a malfunctioning system and likely causes.
  8. Warranty letter from the automatic temperature controls contractor indicating the warranty period for their portion of the work.

9. Signed owner instruction forms for all items specified as requiring owners' instruction.
  10. The Systems manual shall have an index and be broken up by individual systems such as "heating", "shop exhaust", "kitchen ventilation and exhaust", "chilled water", "administration ventilation".
  11. Include at the front of the manual a complete listing of the Architect, Engineer and contractors and sub-contractors used on the project. Listing shall include names, addresses and phone numbers for each.
  12. All major pieces of equipment shall be referenced with the equipment supplier's name, address and phone number shall be provided.
- F. Operations and Maintenance Manuals shall be submitted to the Engineer for approval prior to delivery to the Architect.

#### **1.11 INSTRUCTION OF OWNER'S EMPLOYEES**

- A. Furnish, without additional expense to the Owner, the services of competent instructors, who will give full instructions in the care, adjustment, and operation of all parts of the mechanical equipment to the Owner's employees who are to have charge of the equipment.
- B. An operating and maintenance manual shall be made available to the Owner's operating personnel during the instruction and left with the Owner upon completion of the instruction.
- C. The number of man hours of instruction furnished for each system shall be as specified below. Hours of instruction shall be divided up into a minimum of two (2) instruction periods with 75% of time used for an initial instruction and 25% of time used for a follow up instruction, a minimum of four (4) weeks after initial instruction.
- D. Instruction of Owner's Employees" form at end of this section shall be filled out and signed by Contractor and Owner's Representative and three (3) signed copies of form sent to Engineer.
- E. Owner training and instructions:
  1. Ventilation systems including but not limited to exhaust fans, energy recovery units, and terminal air units shall not be less than two (2) man hours.
  2. Automatic temperature control systems including all components of the system shall be not less than four (4) man hours.

#### **1.12 INSTALLATION OF EQUIPMENT**

- A. All appliances and equipment shall be installed and connected in accordance with manufacturer's instructions and recommendations unless such instructions are in conflict with these specifications. Auxiliary piping, valves, electrical connections, etc., recommended by the manufacturer or required for proper operation shall be furnished and installed complete.
- B. All equipment shall be installed in such a manner and location as to facilitate accessibility for maintenance and/or replacement.
- C. As a part of the work of this contract, the Mechanical Contractor shall make any changes in the pulleys, belts, and dampers, and shall install additional dampers required for correct balance as recommended by air balance agency, at no additional cost to the Owner.
- D. The use of permanent HVAC systems for temporary heating, cooling, ventilating, and conditioning is strictly prohibited without written authorization from the Engineer.

#### **1.13 RECORD DRAWING**

- A. The contractor shall maintain one set of drawings at the job site used as a master copy. Each change order or other revision, deletion, or addition shall be clearly marked and noted by colored pencil. This copy of plans shall be furnished to the Architect upon completion of the project.
- B. The contractor shall note on the record drawings the elevations and/or inverts of all mechanical services (i.e., sewer, water, etc.) where they exit the building foundation. The contractor shall

also record dimensions from the building to points on all mechanical equipment installed (ie., fuel tanks, oil piping, etc.).

- C. A complete set of these drawings shall be scanned at a resolution of 600dpi in color and saved in an Adobe PDF portfolio format with index to each sheet by name and burned to a non-volatile media. The electronic copy of the as-built drawings shall be transmitted to the Engineer. After review and approval by the Engineer, the as-built drawings will be turned over to the Owner.

#### **1.14 COOPERATION WITH OTHER TRADES**

- A. Cooperate with other trades so as to avoid interferences. Where required to avoid interferences with other work or to increase the headroom, the Contractor shall off-set the piping and/or re-route the duct work where directed by the Engineer. Carefully check all construction details to assure the proper installation of all work under this specification. Schedule the work such that it will keep pace with the work of other crafts and cause no delay.

#### **1.15 INSPECTION OF SITE**

- A. Before submitting a proposal on the work contemplated in these specifications and accompanying drawings, each bidder shall examine the site and familiarize themselves with all of the existing conditions and limitations. No extras will be allowed because of Contractor's misunderstanding as to the amount of work involved or lack of his knowledge of any condition in connection with the new construction.

#### **1.16 PAVEMENT, CURB AND SIDEWALK REPLACEMENT**

- A. This Contractor shall be responsible for replacement of existing street pavement, curbs, and sidewalks, etc., removed or damaged by them during the course of the work, unless such pavement, curbs, sidewalks are to be constructed under the General Contract. The work shall be done in accordance with local requirements.

#### **1.17 SALVAGE**

- A. All items removed from existing building shall be salvaged in a workmanlike manner.
- B. The handling, storage, and disposition of salvage materials shall be as directed by the Architect. Generally, all salvage material shall remain the property of the Owner. Materials and equipment not wanted by Owner shall be removed from the job site and become the property of the contractor.

#### **1.18 CODES, ORDINANCES, REGULATIONS & STANDARDS**

- A. The entire installation shall be made in accordance with all state and local laws. If, in any instance, the plans and specifications conflict with such laws, the law shall take precedence. This, however, shall not be construed as relieving the contractor from complying with any requirements of the drawings and specifications that may be in excess of the rules and not contrary to the same.
- B. All work shall conform to applicable state and local codes, ordinances, regulations and/or standards.

#### **1.19 PERMITS AND LICENSES**

- A. This contractor shall obtain and pay for all licenses and permits and shall pay for all fees and charges for the connection to outside services and use of property other than the site of the work for storage of materials or other purposes.
- B. Contractor shall coordinate and request all inspections from authority having jurisdiction. The Contractor shall notify the Architect of all such coordinated inspections (date & time) and shall submit certificates of inspection and final approval of the local inspection authority.

## **1.20 TESTS**

- A. Test all equipment installed under these specifications and demonstrate its proper operation to the Engineer.
- B. Do not test or operate equipment for any purpose, until it has been fully lubricated in accordance with the manufacturer's instructions and, if it is a centrifugal pump, until it has been connected to the piping system with sufficient water so that it will not run dry.
- C. Submit to the Engineer air balance and water balance reports indicating test results as hereinafter specified under Section 230593 "TESTING, ADJUSTING AND BALANCING FOR HVAC".
- D. All testing shall be completed before final inspection, and test results shall be available during the final inspection.

## **1.21 GUARANTEES**

- A. This contractor shall guarantee all equipment, material, and workmanship for a period of one year from date of final certificate. Any defects in mechanical equipment, workmanship or materials that appear, or cause trouble of any kind within a period of one year from date of final certificate shall be remedied, free of charge. Refer to other sections of these specifications for guarantees in excess of the requirements herein described.

## **1.22 CONSTRUCTION CLOSEOUT DOCUMENTS**

- A. This Contractor and their subcontractors should proceed immediately to fully complete the work as listed at the end of this Section. The Contractor responsible shall initial and date the "Contractor Completed" column after each item as it is complete and forward a copy of the fully completed punch list to the Engineers for their final approval before final punch list inspection. Reply with an NA where items don't pertain.

## **PART 2 PRODUCTS**

### **2.01 NOT USED**

**PART 3 EXECUTION**

**3.01 INSTRUCTION TO OWNER'S EMPLOYEES FORM**

DATE \_\_\_\_\_

**INSTRUCTION OF OWNER'S EMPLOYEES**

This letter shall certify that the Contractor has furnished the Owner with full instructions in the care and operation of all parts of the mechanical system as specified under Section 23 0100 paragraph entitled "Instruction of Owner's Employees".

Section	Owner's Initial Instructions			Owner's Follow-up Instructions		
	Hours	Date	Initials	Hours	Date	Initials
Ventilation						
Temperature Control						

**3.02 LIST OF CONSTRUCTION CLOSEOUT DOCUMENTS**

SECTION	DOCUMENT	DATE/INITIALS	APPROVED
23 01 00	Record drawings - HVAC & Controls		
23 01 00	O&M Manuals - HVAC & Controls		
23 01 00	Owner instruction - HVAC & Controls		
23 05 53	Valve, pipe, duct, equipment labeling & valve schedule		
23 05 93	Submit test & balance report		
23 07 13	Verify ductwork above ceiling fully insulated		
23 09 23	Verify thermostats are programmed and calibrated		
Div. 23	Ensure all holes existing and new have been patched, all duct/pipe penetrations have been draft stopped or fire caulked and painted to match		
Div. 23	Provide documentation that extra AHU filters specified have been turned over		
Div. 23	Clean all mechanical areas of debris, wipe down all fixtures and equipment. Remove all extra material and garbage from site		

**END OF SECTION**

**SECTION 23 0150  
MECHANICAL MATERIALS & METHODS**

**PART 1 GENERAL**

**1.01 APPLICABILITY**

- A. This section covers basic materials and methods and applies to and forms a part of each of the sections of Division 23.
- B. This work shall be in accordance with this and other applicable sections and/or provisions of these specifications and with the applicable drawings.

**1.02 COORDINATION OF OPENINGS**

- A. This contractor shall coordinate all openings required for new piping, ductwork, equipment, controls, etc. through any structural slabs, beams, or walls. Contractor shall request a copy of the precast concrete shop drawings and verify locations and sizes of all openings required.
- B. All costs associated with structural field changes or redesigns of the building systems due to lack of field coordination shall be responsibility of this contractor.

**1.03 MATERIALS & MANUFACTURERS**

- A. All materials and equipment shall be new, free of defects, installed in accordance with manufacturer's current published recommendations in a neat manner and in accordance with standard practice of the industry.
- B. Certain materials and/or equipment in this specification are specified by manufacturer and catalog numbers. The design was based on the specified equipment and establishes a degree of quality, performance, physical configuration, etc. If the contractor should elect to use equipment other than the equipment used as a basis for design but listed as "acceptable" in the specifications, he shall be responsible for space requirements, configuration, performance, and changes in bases, supports, vibration isolators, structural members, openings in structure and other apparatus that may be affected by its use.

**PART 2 PRODUCTS**

**2.01 SUPPORTING STEEL**

- A. Provide structural steel framework for supporting mechanical equipment as required.
- B. All steel work shall be in conformance with the requirements of the AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings. Material shall conform to ASTM A36.

**PART 3 EXECUTION**

**3.01 PROTECTION, DELIVERY AND STORAGE OF MATERIALS**

- A. Make provisions for the delivery and storage of materials and make the required arrangements with other contractors for the introduction into the building of equipment too large to pass through finished openings.
- B. Protect materials and equipment stored on site from weather and moisture by maintaining factory covers and/or suitable weather-proof coverings. For extended outdoor storage, motors shall be removed from equipment and stored separately.
- C. The open ends of all piping and ductwork shall be covered whenever that system is not being worked on, i.e., end of the workday, completion of a section, etc. Covering shall keep dust, garbage, vermin, and other foreign objects out of the piping or ductwork when the contractor is not on the jobsite.

### **3.02 CUTTING AND REPAIRING**

- A. All holes and penetrations required for the installation of the mechanical equipment shall be by the mechanical contractor. This shall include all piping, ductwork, and any other penetration through the wall, floor, or roof.
- B. Cutting construction shall be done only with the written permission of the Architect. Cutting shall be done carefully and damage to buildings, pipes, wiring, or equipment as a result of cutting for installation shall be repaired by skilled mechanics of the trade involved at no additional charge to the Owner. This Contractor shall be responsible for all cutting and patching unless such work has been delegated to the General Contractor.
- C. All holes cut into concrete shall be cut by means of power saws or core drills. All unsightly spalls or chips shall be repaired.
- D. All openings remaining around duct and pipe penetrations shall be filled, caulked, and painted to match wall. Code approved fire caulking shall be used for all rated penetrations.

### **3.03 SEALING FLOOR, CEILINGS AND WALL OPENINGS**

- A. Where pipes or ducts pass through walls, ceilings, floors, or partitions, (other than those through fire rated walls or chases) the opening in the construction around the pipe or duct shall not exceed ½ inch average clearance on all sides and shall be sealed to prevent the passage of sound and air. Coordinate wall openings to allow insulation thickness to pass through walls if allowed.
- B. The material used to seal space between the wall and the pipe/duct shall be non-combustible caulk type, or wrap type, as conditions require. Provide sheet metal angles or flanges as may be required to contain the stopping material. Use of expanding foam will be allowed if surfaces are cleaned of an excess material and all edges are trimmed smooth. Penetrations through exterior walls shall be sealed weather tight.
- C. Special attention shall be given to penetrations of mechanical room walls. Fill gaps around entire exterior area of the pipes or ducts with sound insulation (batt or mineral wool) to within ½” of the wall surface. Use silicone caulking to finish filling the opening smooth with the wall surface or provide sheet metal angles. All sealer shall meet flame spread 25 and smoke developed less than 50.
- D. Where pipes or ducts pass through fire-rated walls, ceilings, floors, vertical service shafts walls, or partitions, the opening in the construction around the pipe or duct shall be fire-stopped to prevent the passage of flame and smoke. All assemblies shall be UL or ASTM listed to provide a fire rating equal to that of the construction being penetrated. For the firestop applications that exist for which no UL tested system is available through a manufacturer, an engineering judgment derived from similar UL system designs or other tests shall be submitted from the manufacturer to the local authorities having jurisdiction for their review and approval prior to installation. Individuals installing the firestopping shall be experienced and certified as required by the manufacturer whose product is being applied. Refer to firestopping specification section for more information.
- E. Manufacturer's assembly drawings shall be provided in O & M Manuals for each type of penetration. Printed metal or plastic labels shall be permanently applied on the structure within 6” of the edge of the firestop system. Metal labels shall be applied with mechanical fasteners & plastic labels shall be the self-adhering type with adhesive capable of permanently bonding labels to the surfaces on which the labels are placed. The information required on the label include UL/ASTM assembly number, date of installation, fire stopping material manufacture name, Contractor's name, address & phone number & the installer's name.
- F. Duct coverings shall not extend through walls or floors required to be fire-stopped or have a fire resistance rating. Insulation shall be taped or sealed to the walls to eliminate sweating at any fire and/or smoke dampers.

- G. Acceptable manufacturers shall be Hilti, 3M Brand, or a prior approved product.

#### **3.04 CLEANING AND PAINTING**

- A. Clear away all debris, surplus materials, etc., resulting from work or operations, leaving the job and equipment furnished under this contract in a clean condition.
- B. All exposed ductwork visible behind grilles, registers or air terminals shall be painted flat black.
- C. All equipment being furnished with finished paint coat shall be examined upon job completion for scratches and other surface damage. All finished surfaces where necessary shall be touched up with touch-up paint of color to match the factory finish.
- D. Paint all exposed bare pipe exterior of the building. Bare pipe shall be painted one coat of No. 7769402 damp-proof red primer as manufactured by Rust-Oleum Corporation, or equal, and one coat of oil paint. Final coat shall be of a color selected by the architect.
- E. Paint all exposed iron and steel work, pipe hangers, pipe stands, uninsulated tanks, supporting steel for equipment and exposed bare pipe in mechanical areas. Iron and steel work and bare pipe shall be painted one coat of No. 4769402 damp-proof red primer as manufactured by Rust-Oleum Corporation, or equal, and one coat of oil paint. Iron and steel work shall be painted black.

#### **3.05 ASBESTOS FREE BUILDING**

- A. There shall be no products or building materials used as a temporary or permanent element in the construction of this building, which has in its make-up any form of asbestos. The contractors shall be responsible to monitor shop drawings and product literature to verify the make-up of materials to be used in the building and remind material suppliers that their products must be asbestos free.
- B. Notify the Architect immediately of any existing materials which are suspected of containing asbestos. Do not disturb or attempt to remove any asbestos containing material. The Architect will contact the Owner and inform them of the Contractors observations. The Owner will obtain and provide the services of professionals skilled in asbestos removal.

#### **3.06 SALVAGE**

- A. All items removed from existing building shall be salvaged in a workmanlike manner.
- B. The handling, storage, and disposition of salvage materials shall be as directed by the Architect. Generally, all salvage material shall remain the property of the Owner. Materials and equipment not wanted by Owner shall be removed from the job site and become the property of the contractor.

**END OF SECTION**

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**SECTION 23 0513  
COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. General construction and requirements.
- B. Applications.
- C. Single phase electric motors.
- D. Electronically Commutated Motors (ECM).

**1.02 REFERENCE STANDARDS**

- A. NEMA MG 00001 - Motors and Generators; 2024.
- B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

**1.03 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Closeout Documents:
  - 1. Maintenance Data: Include assembly drawings, bearing data including replacement sizes, and lubrication instructions.

**1.04 QUALITY ASSURANCE**

- A. Comply with NFPA 70.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Protect motors stored on site from weather and moisture by maintaining factory covers and suitable weather-proof covering. For extended outdoor storage, remove motors from equipment and store separately.

**1.06 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Allis Chalmers
- B. Baldor Electric Company/ABB Group: [www.baldor.com](http://www.baldor.com).
- C. Emerson
- D. General Electric
- E. Marathon
- F. Regal-Beloit Corporation (Century): [www.centuryelectricmotor.com](http://www.centuryelectricmotor.com).
- G. Reliance
- H. Westinghouse

**2.02 GENERAL CONSTRUCTION AND REQUIREMENTS**

- A. Electrical Service:
  - 1. Motors 1/2 HP and Smaller: 115 volts, single phase, 60 Hz.

- B. Construction:
  1. Open drip-proof type except where specifically noted otherwise.
  2. Design for continuous operation in 104 degrees F environment.
  3. Design for temperature rise in accordance with NEMA MG 00001 limits for insulation class, service factor, and motor enclosure type.
  4. All motor shall be premium efficiency type.
- C. Visible Nameplate: Indicating motor horsepower, voltage, phase, cycles, RPM, full load amps, locked rotor amps, frame size, manufacturer's name and model number, service factor, power factor, efficiency.
- D. Wiring Terminations:
  1. Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70, threaded for conduit.
  2. For fractional horsepower motors where connection is made directly, provide threaded conduit connection in end frame.

### **2.03 APPLICATIONS**

- A. Exception: Motors less than 250 watts, for intermittent service may be the equipment manufacturer's standard and need not comply with these specifications.
- B. Motors located in direct drive axial fans: Totally enclosed type.

### **2.04 SINGLE PHASE POWER - SPLIT PHASE MOTORS**

- A. Starting Torque: Less than 150 percent of full load torque.
- B. Starting Current: Up to seven times full load current.
- C. Breakdown Torque: Approximately 200 percent of full load torque.
- D. Drip-proof Enclosure: Class A (50 degrees C temperature rise) insulation, NEMA Service Factor, prelubricated sleeve or ball bearings.
- E. Enclosed Motors: Class A (50 degrees C temperature rise) insulation, 1.0 Service Factor, prelubricated ball bearings.

### **2.05 SINGLE PHASE POWER - CAPACITOR START MOTORS**

- A. Starting Torque: Three times full load torque.
- B. Starting Current: Less than five times full load current.
- C. Motors: Capacitor in series with starting winding; provide capacitor-start/capacitor-run motors with two capacitors in parallel with run capacitor remaining in circuit at operating speeds.
- D. Drip-proof Enclosure: Class A (50 degrees C temperature rise) insulation, NEMA Service Factor, prelubricated sleeve bearings.
- E. Enclosed Motors: Class A (50 degrees C temperature rise) insulation, 1.0 Service Factor, prelubricated ball bearings.

### **2.06 ELECTRONICALLY COMMUTATED MOTORS (ECM)**

- A. Electronically Commutated Motor
  1. Motor to be a DC electronic commutation type motor (ECM) specifically designed for application.
  2. Motors are permanently lubricated, heavy duty ball bearing type to match with the fan load and pre-wired to the specific voltage and phase.
  3. Internal motor circuitry to convert AC power supplied to the fan to DC power to operate the motor.

4. Motor shall be speed controllable down to 20% of full speed (80% turndown). Speed shall be controlled by either a potentiometer dial mounted at the motor or by a 0-10 VDC signal.

### **PART 3 EXECUTION**

#### **3.01 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install securely on firm foundation. Mount ball bearing motors with shaft in any position.
- C. Check line voltage and phase and ensure agreement with nameplate.

**END OF SECTION**

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**SECTION 23 0553  
IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Nameplates.
- B. Tags.
- C. Pipe/Duct markers.
- D. Ceiling markers/tacks.

**1.02 REFERENCE STANDARDS**

- A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2023.
- B. ASTM D709 - Standard Specification for Laminated Thermosetting Materials; 2025.

**1.03 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Product Data: Provide manufacturers catalog literature for each product required.
- C. Closeout Documents:
  - 1. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.
  - 2. Manufacturer's Installation Instructions: Indicate special procedures, and installation.

**PART 2 PRODUCTS**

**2.01 IDENTIFICATION APPLICATIONS**

- A. Air Handling Units: Nameplates.
- B. Air Terminal Units: Nameplates.
- C. Automatic Controls: Tags. Key to control schematic.
- D. Control Panels: Nameplates.
- E. Dampers: Ceiling tacks, where located above lay-in ceiling.
- F. Ductwork: Duct Markers.
- G. Instrumentation: Tags.
- H. Major Control Components: Nameplates.
- I. Thermostats: Nameplates.

**2.02 NAMEPLATES**

- A. Manufacturers:
  - 1. Brimar Industries, Inc: [www.pipemarker.com/#sle](http://www.pipemarker.com/#sle).
  - 2. Craftmark Pipe Markers: [www.craftmarkid.com/#sle](http://www.craftmarkid.com/#sle).
  - 3. Kolbi Pipe Marker Co: [www.kolbipipemarkers.com](http://www.kolbipipemarkers.com).
  - 4. Seton Identification Products, a Tricor Direct Company: [www.seton.com](http://www.seton.com).
  - 5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Letter Color: White.
- C. Letter Height: 1/2 inch.
- D. Background Color: Black.
- E. Plastic: Comply with ASTM D709.

## 2.03 TAGS

- A. Manufacturers:
  - 1. Brady Corporation: [www.bradycorp.com](http://www.bradycorp.com).
  - 2. Brimar Industries, Inc: [www.pipemarker.com/#sle](http://www.pipemarker.com/#sle).
  - 3. Craftmark Pipe Markers: [www.craftmarkid.com/#sle](http://www.craftmarkid.com/#sle).
  - 4. Kolbi Pipe Marker Co: [www.kolbipipemarkers.com](http://www.kolbipipemarkers.com).
  - 5. Seton Identification Products, a Tricor Company: [www.seton.com](http://www.seton.com).
- B. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch diameter.
- C. Valve Tag Chart: Typewritten letter size list in anodized aluminum frame.

## 2.04 PIPE MARKERS

- A. Manufacturers:
  - 1. Brady Corporation: [www.bradycorp.com](http://www.bradycorp.com).
  - 2. Brimar Industries, Inc: [www.pipemarker.com/#sle](http://www.pipemarker.com/#sle).
  - 3. Craftmark Pipe Markers: [www.craftmarkid.com/#sle](http://www.craftmarkid.com/#sle).
  - 4. Kolbi Pipe Marker Co: [www.kolbipipemarkers.com/#sle](http://www.kolbipipemarkers.com/#sle).
  - 5. Seton Identification Products, a Tricor Company: [www.seton.com](http://www.seton.com).
  - 6. Substitutions: See Section 01 6000 - Product Requirements.
- B. Color: Comply with ASME A13.1.
- C. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings. Provide sticker/tape with flow arrows around the circumference of the piping at each end of pipe marker to hold marker in place.
- D. Color code as follows:
  - 1. Heating, Cooling, and Boiler Feedwater: Green with white letters.
  - 2. Toxic and Corrosive Fluids: Orange with black letters.
  - 3. Compressed Air: Blue with white letters.
  - 4. Flammable and oxidizing fluids: Yellow with black letters.

## 2.05 CEILING TACKS/MARKERS

- A. Manufacturers:
  - 1. Craftmark: [www.craftmarkid.com](http://www.craftmarkid.com).
  - 2. Moore
  - 3. Seton
  - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Description: Sticker with 3/4 inch diameter color coded head.
  - 1. Color code as follows:
    - a. Fire Dampers and Smoke Dampers: Red.
    - b. Heating/Cooling Valves: Yellow.
    - c. Flammable Fluid Valves:

## PART 3 EXECUTION

### 3.01 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.

### 3.02 INSTALLATION

- A. Ductwork shall be identified as indicated below. Ductwork label shall also include the equipment served.
  - Supply Air
  - Supply

Return Air  
Exhaust Air  
Outside Air

Return  
Exhaust  
Outside

- B. Valves controlling mains, risers and branches, but not individual shut-off or local control valves on equipment, shall be identified by a tag. Schedules, framed under glass and mounted where directed, shall be provided showing a complete listing of all valve tags and giving numbers, locations, and color codes, if any, of pipes controlled. Frames shall be secured to wall by not less than four screws. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- C. Install tags with corrosion resistant chain.
- D. Install plastic pipe and duct markers in accordance with manufacturer's instructions.
- E. Equipment serving different areas of a building other than where they are installed shall be permanently marked in an approved manner that uniquely identifies the equipment and the area it serves.
- F. Provide a minimum one label per pipe/duct per room. Where pipes are racked, install pipe markers on each pipe in the same location to aid in differentiating each pipe in the rack.
- G. For insulated pipes and ducts, marker size shall be based on insulation size, not pipe or duct size.
- H. Locate ceiling tacks/markers to locate valves or dampers above lay-in panel ceilings. Locate in corner of panel closest to equipment.

**END OF SECTION**

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**SECTION 23 0593  
TESTING, ADJUSTING, AND BALANCING FOR HVAC**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Testing, adjustment, and balancing of air systems.
- B. Measurement of final operating condition of HVAC systems.

**1.02 REFERENCE STANDARDS**

- A. AABC (NSTSB) - AABC National Standards for Total System Balance, 7th Edition; 2016.
- B. ASHRAE Std 111 - Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems; 2024, with Errata (2025).
- C. NEBB (TAB) - Procedural Standard for Testing, Adjusting and Balancing of Environmental Systems; 2019, with Errata (2022).
- D. SMACNA (TAB) - HVAC Systems Testing, Adjusting and Balancing; 2023.

**1.03 QUALITY ASSURANCE**

- A. Agent Qualifications: Engage a testing, adjusting, and balancing agent who conforms to the standards set forth by either AABC, NEBB or TABB.

**1.04 PREINSTALLATION CONFERENCE**

- A. Testing, Adjusting and Balancing Conference: Meet with the Owner's and the Architect's representatives on approval of the testing, adjusting, and balancing strategies and procedures plan to develop a mutual understanding of the details. Ensure the participation of testing, adjusting, and balancing team members, equipment manufacturers' authorized service representatives, HVAC controls Installer, and other support personnel. Provide 7 days' advance notice of scheduled meeting time and location.
  - 1. Agenda Items: Include at least the following:
    - a. Submittal distribution requirements.
    - b. Contract Documents examination report.
    - c. Testing, adjusting, and balancing plan.
    - d. Work schedule and Project site access requirements.
    - e. Coordination and cooperation of trades and subcontractors.
    - f. Coordination of documentation and communication flow.

**1.05 COORDINATION**

- A. Coordinate the efforts of factory-authorized service representatives for systems and equipment, HVAC controls installers, and other mechanics to operate HVAC systems and equipment to support and assist testing, adjusting, and balancing activities.
- B. Provide 7 days' advance notice for each test. Include scheduled test dates and times.
- C. Perform testing adjusting and balancing after leakage and pressure tests on air and water distribution systems have been satisfactorily completed.

**1.06 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Prior to testing, adjusting and balancing the system, the Contractor shall submit 2 copies of the proposed test report forms for engineer's approval.
  - 2. Certified Testing, Adjusting and Balancing Reports: Submit 2 copies of reports prepared, as specified in this Section, on approved forms certified by the testing, adjusting, and balancing Agent.

3. Installer Qualifications: Submit name of adjusting and balancing agency and TAB supervisor for approval within 30 days after award of Contract.. Submit 2 copies of the NEBB or AABC certificate for each member of the testing, adjusting, and balancing Agent team
4. TAB Plan: Submit 2 copies of a written plan indicating the testing, adjusting, and balancing standard to be followed and the specific approach for each system and component.
  - a. Submit to Engineer.
5. Include at least the following in the plan:
  - a. Copy of field checkout sheets and logs to be used, listing each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
  - b. Identification and types of measurement instruments to be used and their most recent calibration date.
  - c. Final test report forms to be used.
  - d. Procedures for formal deficiency reports, including scope, frequency and distribution.
- C. Control System Coordination Reports: Communicate in writing to the controls installer all setpoint and parameter changes made or problems and discrepancies identified during TAB that affect, or could affect, the control system setup and operation.
- D. Closeout Documents:
  1. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
    - a. Units of Measure: Report data in I-P (inch-pound) units only.
    - b. Include the following on the title page of each report:
      - 1) Name of Testing, Adjusting, and Balancing Agency.
      - 2) Address of Testing, Adjusting, and Balancing Agency.
      - 3) Telephone number of Testing, Adjusting, and Balancing Agency.
      - 4) Project name.
      - 5) Project location.
      - 6) Project Engineer.
      - 7) Project Engineer.
      - 8) Project Contractor.
      - 9) Project altitude.
      - 10) Report date.
      - 11) Signature of testing, adjusting, and balancing Agent who certifies the report.
    - c. In addition to the certified field report data, include the following;
      - 1) Fan curves.
    - d. Summary of contents, including the following:
      - 1) Design versus final performance.
      - 2) Notable characteristics of systems.
    - e. Description of system operation sequence if it varies from the Contract Documents.
    - f. Notes to explain why certain final data in the body of reports vary from design values.
  2. Instrument Calibration Reports: For instrument calibration, include the following:
    - a. Instrument type and make
    - b. Serial number.
    - c. Application.
    - d. Dates of use.
    - e. Dates of calibration.
  3. Project Record Documents: Record actual locations of flow measuring stations and balancing valves and rough setting.

## 1.07 WARRANTY

- A. Test and balance agency shall include an extended warranty of 90 days, after completion of the test and balance work, during which time the Engineer at his discretion may request a recheck, or resetting of any outlet, supply air fan, or exhaust fan as listed in test report. The agency shall provide technicians to assist the Engineer in making any tests he may require during this period of time.

## PART 2 PRODUCTS - NOT USED

## PART 3 EXECUTION

### 3.01 GENERAL REQUIREMENTS

- A. Perform total system balance in accordance with one of the following:
  - 1. AABC (NSTSB), AABC National Standards for Total System Balance.
  - 2. ASHRAE Std 111, Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning, and Refrigeration Systems.
  - 3. NEBB Procedural Standards for Testing Adjusting Balancing of Environmental Systems.
  - 4. SMACNA (TAB).
  - 5. Maintain at least one copy of the standard to be used at project site at all times.
- B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.
- C. Where HVAC systems and/or components interface with life safety systems, including fire and smoke detection, alarm, and control, coordinate scheduling and testing and inspection procedures with the authorities having jurisdiction.
- D. TAB Agency Qualifications:
  - 1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.
  - 2. Having minimum of three years documented experience.
  - 3. Certified by one of the following:
    - a. AABC, Associated Air Balance Council: [www.aabc.com/#sle](http://www.aabc.com/#sle); upon completion submit AABC National Performance Guarantee.
    - b. NEBB, National Environmental Balancing Bureau: [www.nebb.org/#sle](http://www.nebb.org/#sle).
    - c. TABB, The Testing, Adjusting, and Balancing Bureau of National Energy Management Institute: [www.tabbcertified.org/#sle](http://www.tabbcertified.org/#sle).
- E. TAB Supervisor and Technician Qualifications: Certified by same organization as TAB agency.

### 3.02 EXAMINATION

- A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
  - 1. Verify that balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are required by the Contract Documents. Verify that quantities and locations of these balancing devices are accessible and appropriate for effective balancing and for efficient system and equipment operation.
  - 2. Systems are started and operating in a safe and normal condition.
  - 3. Temperature control systems are installed complete and operable.
  - 4. Proper thermal overload protection is in place for electrical equipment.
  - 5. Final filters are clean and in place. If required, install temporary media in addition to final filters.
  - 6. Duct systems are clean of debris.
  - 7. Fans are rotating correctly.
  - 8. Fire and volume dampers are in place and open.

9. Access doors are closed and duct end caps are in place.
  10. Air outlets are installed and connected.
  11. Duct system leakage is minimized.
  12. Examine automatic temperature system components to verify the following:
    - a. Dampers, valves, and other controlled devices operate by the intended controller.
    - b. Dampers and valves are in the position indicated by the controller.
    - c. Integrity of valves and dampers for free and full operation and for tightness of fully closed and fully open positions. This includes dampers in mixing boxes, and variable-air-volume terminals.
    - d. Automatic modulating and shutoff valves, including 2-way valves and 3-way mixing and diverting valves, are properly connected.
    - e. Thermostats and humidistats are located to avoid adverse effects of sunlight, drafts, and cold walls.
    - f. Sensors are located to sense only the intended conditions.
    - g. Sequence of operation for control modes is according to the Contract Documents
    - h. Controller set points are set at design values. Observe and record system reactions to changes in conditions. Record default set points if different from design values.
    - i. Interlocked systems are operating.
    - j. Changeover from heating to cooling mode occurs according to design values.
  13. Report deficiencies discovered before and during performance of testing, adjusting, and balancing procedures.
- B. Examine approved submittal data of HVAC systems and equipment.
  - C. Examine Project record documents described in Division 1 Section "Project Record Documents."
  - D. Examine equipment performance data, including fan and pump curves. Relate performance data to project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system. Calculate system effect factors to reduce the performance ratings of HVAC equipment when installed under conditions different from those presented when the equipment was performance tested at the factory. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," Sections 7 through 10; or in SMACNA's "HVAC Systems-Duct Design," Sections 5 and 6. Compare this data with the design data and installed conditions.
  - E. Submit field reports. Report defects and deficiencies that will or could prevent proper system balance.
  - F. Beginning of work means acceptance of existing conditions.

### **3.03 PREPARATION**

- A. Any changing of pulley sizes if found necessary when testing systems, shall be done by this contractor. Any additional dampers which may be found necessary to get proper air supply and quantity shall be furnished by this contractor at no expense to the Owner
- B. Complete system readiness checks and prepare system readiness reports. Verify the following:
  1. Permanent electrical power wiring is complete.
  2. Automatic temperature-control systems are operational.
  3. Equipment and duct access doors are securely closed.
  4. Balance, smoke, and fire dampers are open.
  5. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
  6. Windows and doors can be closed so design conditions for system operations can be met.

### **3.04 ADJUSTMENT TOLERANCES**

- A. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.

### **3.05 RECORDING AND ADJUSTING**

- A. Field Logs: Maintain written logs including:
  - 1. Running log of events and issues.
  - 2. Discrepancies, deficient or uncompleted work by others.
  - 3. Contract interpretation requests.
  - 4. Lists of completed tests.
- B. Ensure recorded data represents actual measured or observed conditions.
- C. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- D. Mark on drawings the locations where traverse and other critical measurements were taken and cross reference the location in the final report.
- E. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
- F. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
- G. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by the Owner.

### **3.06 AIR SYSTEM PROCEDURE**

- A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.
- B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
- C. Measure air quantities at air inlets and outlets.
- D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
- E. Use volume control devices to regulate air quantities only to extend that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
- F. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.
- G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.
- H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.
- I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
- J. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.
- K. Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance variable volume systems at maximum air flow rate, full cooling, and at minimum air flow rate, full heating.

- L. Measure building static pressure and adjust supply, return, and exhaust air systems to provide required relationship between each to maintain approximately 0.05 inches positive static pressure near the building entries.
- M. Balancing dampers shall be adjusted to minimize noise through VAV box by adjusting the balancing damper as required so the motorized damper in the VAV box is no greater than 25% closed to achieve minimum design airflow rate. Balancing damper handles shall be secured once balancing is completed to ensure dampers will remain in place after balancing is complete. Check multi-zone units for motorized damper leakage. Adjust air quantities with mixing dampers set first for cooling, then heating, then modulating.
- N. For variable air volume system powered units set volume controller to air flow setting indicated. Confirm connections properly made and confirm proper operation for automatic variable air volume temperature control.
- O. On fan powered VAV boxes, adjust air flow switches for proper operation.

### **3.07 VARIABLE FREQUENCY DRIVES/ECM MOTORS**

- A. Variable Frequency Drives (VFD) and/or ECM motors are installed on some of the fans on the job. Each fan VFD/ECM motor may be used to balance the airflow. The fan shall be resheaved as necessary to have the balanced airflow discharged with the VFD set at 60 Hz (ECM motor at 100%). Coordinate resheaving necessary with Mechanical Contractor
- B. Variable Frequency Drives (VFD) and/or ECM motors are installed on some of the pumps on the job. Each pump VFD/ECM motor may be used to balance the waterflow. False head shall not be placed on the system with a balancing valve in order to get the pump to run at 60 Hz/100%.

### **3.08 ADDITIONAL TESTS**

- A. Within 90 days of completing testing, adjusting, and balancing, perform additional testing and balancing to verify that balanced conditions are being maintained throughout and to correct unusual conditions.
- B. Seasonal Periods: If initial testing, adjusting, and balancing procedures were not performed during near peak summer and winter conditions, perform additional inspections, testing, and adjusting during near-peak summer and winter conditions.

### **3.09 PRESSURE TESTING OF DUCTWORK**

- A. The balancing subcontractor shall be responsible for pressure test verification of the entire ventilation system for leakage. Supply all necessary equipment to pressure test duct work. Pressure testing shall take place during construction as required, in accordance with Section 23 3100
- B. Testing supply, return and exhaust duct work shall be done as follows: After the duct work is fabricated and installed, it shall be isolated in sections and tested for air tightness. The air pressure used for the test shall match that specified under Section 23 3100. The ductwork shall be tested to a pressure class A as described per SMACNA. The ductwork shall be tested so that the sealing of the ductwork shall be a leakage class 6. This means that 6 CFM of leakage per 100 sq ft of duct surface is the maximum allowable threshold if tested at 1 inch test pressure. See additional duct sealing requirements in the latest edition SMACNA manual "HVAC Air Duct Leakage Test Manual." Do this prior to applying any thermal insulation. In testing for air tightness, the main trunk shall be first tested by blanking off all branch take-offs, then each branch shall be tested individually after main trunk is proven to be air tight. No equipment connections shall be made on ends of branches until after testing. Ends and other branches shall be blanked off with air tight seals made of galvanized blanks taped in place or other approved methods. Soap solution brushed on shall be used where necessary to detect small leaks.

- C. The balancing contractor performing the leakage testing shall utilize a small scale drawing to show which ductwork corresponds to the duct testing data. This drawing shall individually number each section of ductwork being tested and be included in the final duct pressure testing and balancing report.
- D. Duct pressure testing report shall include the following information:
  - 1. The date of the test.
  - 2. The project name.
  - 3. A description of the duct being tested (identification of duct from small scale plan as called out above), sealing classification and duct classification.
  - 4. The design and actual test static pressures.
  - 5. The design and actual leakage rate.
  - 6. Calculation of duct leakage rate.
  - 7. If the duct passed or failed.
  - 8. Description of the apparatus utilized during testing including orifice size, manufacturer and date calibrated.
  - 9. The actual orifice pressure drop with the actual flow.
  - 10. The name of the person performing the test and any witnesses.

### **3.10 SCOPE**

- A. Test, adjust, and balance the following:
  - 1. Air Handling Units.
  - 2. Fans.
  - 3. Air Terminal Units.
  - 4. Air Inlets and Outlets.

### **3.11 MINIMUM DATA TO BE REPORTED**

- A. Electric Motors:
  - 1. Manufacturer.
  - 2. Model/Frame.
  - 3. HP/BHP.
  - 4. Phase, voltage, amperage; nameplate, actual, no load.
  - 5. RPM.
  - 6. Service factor.
  - 7. Starter size, rating, heater elements.
  - 8. Sheave Make/Size/Bore.
- B. V-Belt Drives:
  - 1. Identification/location.
  - 2. Required driven RPM.
  - 3. Driven sheave, diameter and RPM.
  - 4. Belt, size and quantity.
  - 5. Motor sheave diameter and RPM.
  - 6. Center to center distance, maximum, minimum, and actual.
- C. Electric Duct Heaters:
  - 1. Manufacturer.
  - 2. Identification/number.
  - 3. Location.
  - 4. Model number.
  - 5. Design kW.
  - 6. Number of stages.
  - 7. Phase, voltage, amperage.

8. Test voltage (each phase).
  9. Test amperage (each phase).
  10. Air flow, specified and actual.
  11. Temperature rise, specified and actual.
- D. Air Moving Equipment:
1. Location.
  2. Manufacturer.
  3. Model number.
  4. Serial number.
  5. Arrangement/Class/Discharge.
  6. Air flow, specified and actual.
  7. Return air flow, specified and actual.
  8. Outside air flow, specified and actual.
  9. Total static pressure (total external), specified and actual.
  10. Inlet pressure.
  11. Discharge pressure.
  12. Sheave Make/Size/Bore.
  13. Number of Belts/Make/Size.
  14. Fan RPM.
- E. Return Air/Outside Air:
1. Identification/location.
  2. Design air flow.
  3. Actual air flow.
  4. Design return air flow.
  5. Actual return air flow.
  6. Design outside air flow.
  7. Actual outside air flow.
  8. Return air temperature.
  9. Outside air temperature.
  10. Required mixed air temperature.
  11. Actual mixed air temperature.
  12. Design outside/return air ratio.
  13. Actual outside/return air ratio.
- F. Exhaust Fans:
1. Location.
  2. Manufacturer.
  3. Model number.
  4. Serial number.
  5. Air flow, specified and actual.
  6. Total static pressure (total external), specified and actual.
  7. Inlet pressure.
  8. Discharge pressure.
  9. Sheave Make/Size/Bore.
  10. Number of Belts/Make/Size.
  11. Fan RPM.
- G. Terminal Unit Data:
1. Manufacturer.
  2. Type, constant, variable, single, dual duct.
  3. Identification/number.

4. Location.
5. Model number.
6. Size.
7. Minimum static pressure.
8. Minimum design air flow.
9. Maximum design air flow.
10. Maximum actual air flow.
11. Inlet static pressure.

H. Air Distribution Tests:

1. Air terminal number.
2. Room number/location.
3. Terminal type.
4. Terminal size.
5. Area factor.
6. Design velocity.
7. Design air flow.
8. Test (final) velocity.
9. Test (final) air flow.
10. Percent of design air flow.

**END OF SECTION**

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**SECTION 23 0713  
DUCT INSULATION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Duct insulation.
- B. Duct liner.

**1.02 REFERENCE STANDARDS**

- A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.
- B. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2025.
- C. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2024.
- D. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014 (Reapproved 2019).
- E. ASTM C1071 - Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material); 2025.
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2021a.
- G. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.
- H. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015.
- I. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

**1.03 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

**1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section with not less than three years of documented experience.

**1.05 DELIVERY, STORAGE, AND HANDLING**

**1.06 FIELD CONDITIONS**

- A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.
- B. Maintain temperature during and after installation for minimum period of 24 hours.

**PART 2 PRODUCTS**

**2.01 REGULATORY REQUIREMENTS**

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

**2.02 GLASS FIBER, FLEXIBLE**

- A. Manufacturer:
  - 1. Knauf Insulation: [www.knaufinsulation.com](http://www.knaufinsulation.com).

2. Johns Manville: [www.jm.com](http://www.jm.com).
  3. Owens Corning Corporation: [www.ocbuildingspec.com](http://www.ocbuildingspec.com).
  4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Insulation: ASTM C553; flexible, noncombustible blanket.
1. K value: 0.24 at 75 degrees F, when tested in accordance with ASTM C518.
  2. Maximum Service Temperature: 250 degrees F.
  3. Maximum Water Vapor Absorption: 5.0 percent by weight.
- C. Vapor Barrier Jacket:
1. Kraft paper with glass fiber yarn and bonded to aluminized film.
  2. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
  3. Secure with pressure-sensitive tape.
- D. Vapor Barrier Tape:
1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure-sensitive rubber-based adhesive.

### 2.03 GLASS FIBER, RIGID

- A. Manufacturer:
1. Knauf Insulation: [www.knaufinsulation.com](http://www.knaufinsulation.com).
  2. Johns Manville: [www.jm.com](http://www.jm.com).
  3. Owens Corning Corporation: [www.ocbuildingspec.com/sle](http://www.ocbuildingspec.com/sle).
  4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Insulation: ASTM C612; rigid, noncombustible blanket.
1. K Value: 0.24 at 75 degrees F, when tested in accordance with ASTM C518.
  2. Maximum Service Temperature: 450 degrees F.
  3. Maximum Water Vapor Absorption: 5.0 percent.
  4. Maximum Density: 8.0 pcf.
- C. Vapor Barrier Jacket:
1. Kraft paper with glass fiber yarn and bonded to aluminized film.
  2. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
  3. Secure with pressure-sensitive tape.
- D. Vapor Barrier Tape:
1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure-sensitive rubber-based adhesive.

### 2.04 DUCT LINER

- A. Manufacturers:
1. Armacell LLC: [www.armacell.us/#sle](http://www.armacell.us/#sle).
  2. Knauf Insulation: [www.knaufinsulation.com](http://www.knaufinsulation.com).
  3. Johns Manville: [www.jm.com](http://www.jm.com).
  4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Elastomeric Foam Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1, in sheet form.
1. Minimum Service Temperature: Minus 40 degrees F.
  2. Maximum Service Temperature: 180 degrees F.
  3. Fungal Resistance: No growth when tested according to ASTM G21.
  4. Apparent Thermal Conductivity: Maximum of 0.28 at 75 degrees F.
  5. Minimum Noise Reduction Coefficients:
    - a. 1/2 inch Thickness: 0.30.

- b. 1 inch Thickness: 0.40.
- c. 1-1/2 inches Thickness: 0.50.
- d. 2 inch Thickness: 0.60.
- 6. Erosion Resistance: Does not show evidence of breaking away, flaking off, or delamination at velocities of 10,000 fpm when tested in accordance with ASTM C1071.
- 7. Connection: Waterproof vapor barrier adhesive.
- C. Flexible duct liner shall be installed in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible (latest edition) except as modified herein.
- D. Duct liner shall have a minimum sound absorption coefficient of .55 at 1/2" thickness, factory applied edge coating, shall not support mold or fungus growth, shall meet U.L. #181 erosion test
- E. The air stream surface mat of all duct liner shall be treated with an EPA registered anti microbial agent to prevent fungal or bacterial growth.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Test ductwork for design pressure prior to applying insulation materials.
- B. Verify that surfaces are clean, foreign material removed, and dry.

#### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NAIMA National Insulation Standards.
- C. Supply duct shall mean all supply ducts from air handling unit discharge to air outlet (diffuser, register, etc.). This includes all non insulated devices such as terminal coils, distribution boxes, air flow measuring stations, sound attenuators, linear slot plenums, etc. installed in the supply or return duct system. Duct insulation shall extend uninterrupted through all walls with the exception of those containing fire and/or smoke dampers. Coordinate with the installing mechanical contractor(s) at the start of the project to ensure holdouts in walls, where required, are oversized to allow for full insulation thickness to be applied.
- D. All supply ducts passing through spaces without ceilings and not feeding that space shall be insulated as specified.
- E. Insulated ducts conveying air above and below ambient temperature:
  - 1. Provide insulation with vapor barrier jackets.
  - 2. Finish with tape and vapor barrier jacket.
  - 3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
  - 4. Insulate entire system, including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.
- F. Glass fiber - flexible installation:
  - 1. End and longitudinal joints shall be butted firmly and lapped and sealed by adhesive.
  - 2. Mechanical fasteners shall be installed on sides and bottom of ducts spaced at the rate of not less than one fastener per two lineal feet.
  - 3. A single mechanical fasteners shall be installed on any duct width of 24" or larger, two fasteners for 48" or larger, three fasteners for 72" or larger, etc.
  - 4. At all joints, the vapor barrier jackets shall be covered with 5" wide pressure sensitive vapor seal tape, or shall have 2.5" wide laps drawn tight, stapled, and secured with vapor barrier adhesive.
  - 5. The joints and all openings where facing is pierced or punctured by pins, staples, etc. shall be coated with two inch wide strips of vapor barrier coating compound.
- G. Glass fiber - rigid installation:

1. Rigid board fiberglass shall be furnished with a reinforced foil faced vapor barrier jacket. Insulation shall be protected at corners and edges with metal corner strips or clips.
- H. Duct and Plenum Liner Application:
1. Adhere insulation with adhesive for 100 percent coverage.
  2. Seal and smooth joints. Seal and coat transverse joints.
  3. Seal liner surface penetrations with adhesive.
  4. Where duct liner is installed in ducts, the duct size indicated accommodates the liner such that the gross duct dimension is that shown on the drawings. No increase in duct size is necessary to accommodate duct liner thickness.
  5. Casings requiring insulation on the inside shall have liner adhered to all sides of casing with a minimum of 50% coverage of adhesive. In addition, use mechanical fasteners such as Graham Welding Pins, Tuff-Weld Nylon hangers or Stick-Klips on maximum of 16" centers at top and sides. Caulk all joints with fire-retardant mastic to keep moving air from getting behind insulation.

### 3.03 SCHEDULES

#### A. Air Handling Units

Ductwork System	Insulation Type	Insulation Thickness	Density
Supply Duct	Glass fiber flexible	2.2 inch (R value - 6)	3/4 lb/ft <sup>3</sup>
Return Duct	None	None	None

#### B. Energy Recovery Units

Ductwork System	Insulation Type	Insulation Thickness	Density
Supply Duct	Glass fiber flexible	2.2 inch (R value - 6)	3/4 lb/ft <sup>3</sup>
Exhaust Air Duct from unit outlet to building outlet	Glass fiber flexible	2 inch	1-1/2 lb/ft <sup>3</sup>
Outdoor Air Duct	Glass fiber rigid	3 inch	3 lb/ft <sup>3</sup>

#### C. Exhaust Fan Ductwork

Ductwork System	Insulation Type	Insulation Thickness	Density
Exhaust Duct 10 feet back from isolation damper	Glass fiber flexible	2 inch	1-1/2 lb/ft <sup>3</sup>

#### D. Duct Liner

1. All transfer air ducts.
2. All ducts as indicated by cross-hatching or as noted on the drawings.
3. Liner types for the various surfaces shall be as follows:
  - a. Return air ductwork shall be lined with 1" thick elastomeric foam flexible duct liner.
  - b. Transfer air ductwork shall be lined with 1" thick elastomeric foam flexible duct liner.

**END OF SECTION**

**SECTION 23 0784  
MECHANICAL FIRESTOPPING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Firestopping systems.
- B. Firestopping of all mechanical through and membrane penetrations in fire-resistance rated and smoke-resistant assemblies , whether indicated on drawings or not .

**1.02 REFERENCE STANDARDS**

- A. ASTM E 814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops; 2009.
- B. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- C. FM 4991 - Approval of Firestop Contractors; Factory Mutual Research Corporation; 2001.
- D. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.
- E. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; [www.aqmd.gov](http://www.aqmd.gov).
- F. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

**1.03 SUBMITTALS**

- A. See Division 01 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Schedule of Firestopping: List each type of penetration.
  - 2. Product Data: Provide data on product characteristics.
- C. Closeout Documents:
  - 1. Certificate from authority having jurisdiction indicating approval of materials used.

**1.04 QUALITY ASSURANCE**

- A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
  - 1. Listing in the current-year classification or certification books of UL, FM, or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
  - 2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at [www.icc-es.org](http://www.icc-es.org) will be considered as constituting an acceptable test report.
  - 3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
- B. Installer Qualifications: Company specializing in performing the work of this section and:
  - 1. Approved by Factory Mutual Research under FM Standard 4991, Approval of Firestop Contractors , or meeting any two of the following requirements:.
  - 2. With minimum 3 years documented experience installing work of this type.
  - 3. Able to show at least 5 satisfactorily completed projects of comparable size and type.
  - 4. Licensed by authority having jurisdiction.

**1.05 SCOPE / APPLICATION**

- A. Provide installed firestop protects that limit the spread of fire, heat, smoke, and gasses through otherwise unprotected openings in rated assemblies, including walls, partitions, floors, roof/ceilings, and similar locations. restoring the integrity of the fire rated construction to its original fire rating.
- B. Provide firestop systems listed for the specific combination of fire rated construction, type of penetrating item, annular space requirements, and fire rating, and the following criteria:

1. F-Rating: Equal to or greater than the fire-resistance rating of the assembly in which the firestopping will be installed.
2. T-Rating: In habitable areas where penetrating items are exposed to potential contact with materials on fire side(s) of rated assembly, T-rating must equal its F-rating.
3. L-Rating: L-rating of 1 cfm per linear foot (5.5 cu m/h/m) maximum at ambient temperatures.
4. Wall Penetrations: Systems must be symmetrical, with the same rating from both sides of the wall.

## **1.06 FIELD CONDITIONS**

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. 3M Fire Protection Products: [www.3m.com/firestop](http://www.3m.com/firestop).
- B. Hilti, Inc: [www.us.hilti.com](http://www.us.hilti.com).
- C. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 THROUGH PENETRATION FIRESTOP SYSTEMS**

- A. Firestopping: Any material meeting requirements.
  1. Fire Ratings: Use any system listed by UL or tested in accordance with ASTM E 814 that has F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and that meets all other specified requirements.

### **2.03 MATERIALS**

- A. Firestopping Sealants: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
- B. Cast-in-Place Devices: Firestopping device for use prior to a concrete pour. Adjustable height with pull tabs, straight edge design for close placement to walls and adjacent devices.
  1. Fire Resistance: For use in 1, 2, or 3 hour fire rated systems.
- C. One piece metal collar assembly encasing intumescent material for firestopping of pipes and cables through rated walls and floors.
  1. Fire Resistance: For use in 1 or 2 hour fire rated systems.
- D. Plastic Pipe Device: Intumescent device for firestopping of plastic pipe and cables through rated walls and floors.
  1. Configuration: One-piece metal collar, with locking latch and bendable tabs to secure; equipped also for conventional anchoring.
  2. Fire Resistance: For use in 1, 2 or 3 hour fire rated systems.
- E. Elastomeric Silicone Firestopping: Single component silicone elastomeric compound and compatible silicone sealant;
  1. Fire Resistance: For use in 1, 2 or 3 hour fire rated systems.
- F. Foam Firestopping: Single component silicone foam compound;
- G. Fibered Compound Firestopping: Formulated compound mixed with incombustible non-asbestos fibers;
- H. Fiber Firestopping: Mineral fiber insulation used in conjunction with elastomeric surface sealer forming airtight bond to opening;
- I. Firestop Devices - Wrap Type: Mechanical device with incombustible filler and sheet stainless steel jacket, intended to be installed after penetrating item has been installed;

- J. Firestop Devices - Cast-In Type: Sleeve and sealing material, intended to be cast in concrete floor forms or in concrete on metal deck, not requiring any additional materials to achieve penetration seal.
  - 1. Durability and Longevity: Permanent.
- K. Intumescent Putty: Compound that expands on exposure to surface heat gain.
  - 1. Fire Resistance: For use in 1, 2 or 3 hour fire rated systems.
- L. Reusable Firestopping: Removable intumescent compressible shapes, pillows, or blocks specifically tested in removable configuration;:
- M. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify openings are ready to receive the work of this section.

### **3.02 PREPARATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.
- C. Remove incompatible materials that could adversely affect bond.
- D. Install backing materials to arrest liquid material leakage.
- E. Verify that items penetrating fire rated assemblies are securely attached, including sleeves, supports, hangers, and clips.
- F. Verify that openings and adjacent areas are not obstructed by construction that would interfere with installation of firestopping, including ducts, piping, equipment, and other suspended construction.
- G. Install masking and temporary coverings as required to prevent contamination or defacement of adjacent surfaces due to firestopping installation.

### **3.03 INSTALLATION**

- A. Non-rated assemblies shall be draft stopped.
- B. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- C. Install so that openings are completely filled and material is securely adhered.
- D. Where firestopping surface will be exposed to view, finish to a smooth, uniform surface flush with adjacent surfaces.
- E. After installation is complete, remove combustible forming materials and accessories that are not part of the listed system.
- F. Clean firestop materials off surfaces adjacent to openings as work progresses, using methods and cleaning materials approved in writing by firestop system manufacturer and which will not damage the surfaces being cleaned.
- G. Do not cover firestopping with other construction until approval of authority having jurisdiction has been received.
- H. Do not cover installed firestopping until inspected by authority having jurisdiction.
- I. Install labelling required by code.
- J. Install identification Labels for Through Penetration and Construction Joint Systems: Pressure sensitive self-adhesive vinyl labels, preprinted with the following information:

1. The words "Warning - Through Penetration Firestop System - Do not Disturb. Notify Building Management of Any Damage."
2. Listing agency's system number or designation.
3. System manufacturer's name, address, and phone number.
4. Installer's name, address, and phone number.
5. General contractor's name, address, and phone number (if applicable).
6. Date of installation.

#### **3.04 CLEANING**

- A. Clean firestop materials off surfaces adjacent to openings as work progresses, using methods and cleaning materials approved in writing by firestop system manufacturer and which will not damage the surfaces being cleaned
- B. Clean adjacent surfaces of firestopping materials.

#### **3.05 PROTECTION**

- A. Protect adjacent surfaces from damage by material installation.

**END OF SECTION**

**SECTION 23 0913  
INSTRUMENTS AND CONTROL ELEMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Thermostats.
- B. Control panels
- C. Temperature sensors
- D. Duct mounted sensors
- E. Pressure sensors
- F. Status and safety switches

**1.02 REFERENCE STANDARDS**

- A. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.

**1.03 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Product Data: Provide description and engineering data for each control system component. Include sizing as requested. Provide data for each system component and software module.
  - 2. Indicate complete operating data, system drawings, wiring diagrams, and written detailed operational description of sequences. Submit schedule of valves indicating size, flow, and pressure drop for each valve. For automatic dampers indicate arrangement, velocities, and static pressure drops for each system. For variable frequency drives: indicate front and side views of enclosures with overall dimensions and weights shown; conduit entrance locations and requirements; and nameplate legends.
- C. Closeout Documents:
  - 1. Operation and Maintenance Data: Include inspection period, cleaning methods, recommended cleaning materials, and calibration tolerances.
  - 2. Project Record Documents: Record actual location of control components, including panels, thermostats, and sensors.
    - a. Revise shop drawings to reflect actual installation and operating sequences.
  - 3. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

**1.04 QUALITY ASSURANCE**

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum ten (10) years experience approved by manufacturer.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Store equipment in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- B. Handle equipment in accordance with manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to components, enclosure, and finish.

**1.06 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

## **PART 2 PRODUCTS**

### **2.01 EQUIPMENT - GENERAL**

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

### **2.02 CONTROL PANELS**

- A. Unitized cabinet type for each system under automatic control with relays and controls mounted in cabinet and temperature indicators, pressure gauges, pilot lights, push buttons and switches flush on cabinet panel face.
- B. Provide a 120V power transformer and a convenience outlet within the cabinet.
- C. NEMA EN 10250, general purpose utility enclosures with enameled finished face panel.
- D. Provide common keying for all panels.

### **2.03 TEMPERATURE SENSORS**

- A. Sensors and transmitters shall be provided, as outlined in the input/output summary and sequence of operations.
- B. The temperature sensor shall be of the resistance type, and shall be either two-wire 1000 ohm nickel RTD, two-wire 1000 ohm platinum RTD, or 20 kohm NTC.
- C. Chilled water, room temperature, and duct temperature shall be  $\pm 0.5$  deg. F accuracy. All other temperature point types shall be  $\pm 0.75$  deg. F accuracy.
- D. Room Temperature Sensors:
  - 1. Room sensors shall be constructed for either surface or wall box mounting.
  - 2. Room sensors in all public/transitory spaces including corridors, vestibules, receptions areas, restrooms, etc. shall be flat plate sensor only type with no local control/adjustment capabilities.
  - 3. Room sensors in offices, classrooms, or other private/staff controlled spaces shall have an integral LCD display with the following capabilities:
    - a. Display room air temperatures.
    - b. Display and adjust room comfort set point.
    - c. Timed override request push button with LED status for activation of after-hours operation.
    - d. Display controller mode.
    - e. Password selectable adjustment of set point and override modes.

### **2.04 DUCT MOUNT SENSORS**

- A. Duct mount sensors shall mount in an electrical box through a hole in the duct, and be positioned so as to be easily accessible for repair or replacement. Duct sensors shall be insertion type and constructed as a complete assembly, including lock nut and mounting plate. For outdoor air duct applications, a weatherproof mounting box with weatherproof cover and gasket shall be used.
- B. Provide an averaging sensor with multiple sensing points in ductwork greater in any dimension than 48 inches, where air temperature stratification exists, and in air handling unit cabinets. For plenum applications, such as mixed air temperature measurements, a continuous averaging sensor or a string of sensors mounted across the plenum shall be used to account for stratification and/or air turbulence. The averaging string shall have a minimum of 4 sensing points per 12-foot long segment. Capillary supports at the sides of the duct shall be provided to support the sensing string.

## **2.05 PRESSURE SENSORS**

- A. Verify range of static pressure sensors. Velocity pressures of 1 inch w.c. corresponds to duct velocity 4000 fpm.
- B. Air static pressure and velocity pressure sensors shall be differential type with pressure sensing diaphragm housed in a brass body. The body shall have two 3/16 inch barbed fittings suitable for connection by ¼ inch pneumatic tubing. Pressure range shall be 0 to 5 in. w.c. for static pressure sensing and 0 to 1 inch w.c. for velocity pressure sensing. The sensor shall allow a 200% of full scale over-pressure without damage or permanent offset. The output signal shall be 0-10 VDC or 4-20 mA and linear with applied pressure and shall have a field adjustable offset and span. Input power shall be 24 VAC or 24 VDC. Accuracy shall be +/- 1% of full scale.

## **2.06 STATUS AND SAFETY SWITCHES**

- A. General Requirements - Switches shall be provided to monitor equipment status, safety conditions, and generate alarms at the BMS when a failure or abnormal condition occurs. Safety switches shall be provided with two sets of contacts and shall be interlock wired to shut down respective equipment.
- B. Current Sensing Switches - The current sensing switch shall be self-powered with solid-state circuitry and a dry contact output. It shall consist of a current transformer, a solid state current sensing circuit, adjustable trip point, solid state switch, SPDT relay, and an LED indicating the on or off status. A conductor of the load shall be passed through the window of the device. It shall accept over-current up to twice its trip point range. Current sensing switches shall be used for run status for fans, pumps, and other miscellaneous motor loads. Current sensing switches shall be calibrated to show a positive run status only when the motor is operating under load. A motor running with a broken belt or coupling shall indicate a negative run status.
- C. Air Filter Status Switches - Differential pressure switches used to monitor air filter status shall be of the automatic reset type with SPDT contacts rated for 2 amps at 120VAC. A complete installation kit shall be provided, including: static pressure taps, tubing, fittings, and air filters. Provide appropriate scale range and differential adjustment for intended service.
- D. Air Flow Switches - Differential pressure flow switches shall be bellows actuated mercury switches or snap acting micro-switches with appropriate scale range and differential adjustment for intended service.
- E. Air Pressure Safety Switches - Air pressure safety switches shall be of the manual reset type with SPDT contacts rated for 2 amps at 120VAC. Pressure range shall be adjustable with appropriate scale range and differential adjustment for intended service.
- F. Low Temperature Limit Switches - The low temperature limit switch shall be of the manual reset type with Double Pole/Single Throw snap acting contacts rated for 16 amps at 120VAC. The sensing element shall be a minimum of 15 feet in length and shall react to the coldest 18-inch section. Element shall be mounted horizontally across duct in accordance with manufacturers recommended installation procedures. For large duct areas where the sensing element does not provide full coverage of the air stream, additional switches shall be provided as required to provide full protection of the air stream.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that systems are ready to receive work.
- C. Beginning of installation means installer accepts existing conditions.
- D. Sequence work to ensure installation of components is complementary to installation of similar components in other systems.

- E. Coordinate installation of system components with installation of mechanical systems equipment such as air handling units and air terminal units.
- F. Ensure installation of components is complementary to installation of similar components.
- G. Coordinate installation of system components with installation of mechanical systems equipment such as air handling units and air terminal units.
- H. Verify that surface is suitable for controller installation.
- I. Do not install controller until building environment can be maintained within the service conditions required by the manufacturer.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Mount thermostats or temperature sensors on interior walls.
  - 1. If thermostats or sensors must be mounted on exterior wall, provide insulated sub-base.
- C. Mount freeze protection thermostats using flanges and element holders.
- D. Provide separable sockets for liquids and flanges for air bulb elements.
- E. Provide guards on thermostats in entrances and public areas.
- F. Mount control panels adjacent to associated equipment on vibration free walls or free-standing angle iron supports. One cabinet may accommodate more than one system in same equipment room. Provide engraved plastic nameplates for instruments and controls inside cabinet and engraved plastic nameplates on cabinet face.
- G. Install "hand/off/auto" selector switches to override automatic interlock controls when switch is in "hand" position.

### **3.03 MAINTENANCE**

- A. Provide service and maintenance of control system for one year from Date of Substantial Completion.
- B. Provide complete service of controls systems, including call backs, and submit written report of each service call.
- C. In addition to normal service calls, make minimum of seasonal complete normal inspections of approximately four hours duration to inspect, calibrate, and adjust controls.

**SECTION 23 0923  
DIRECT-DIGITAL CONTROL SYSTEM FOR HVAC**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. System description.
- B. Operator interface.
- C. Web browser interface.
- D. Controllers.
- E. Power supplies and line filtering.
- F. BACNET capabilities.
- G. System software.

**1.02 REFERENCE STANDARDS**

- A. ASHRAE Std 135 - BACnet - A Data Communication Protocol for Building Automation and Control Networks; 2024, with Errata (2026).
- B. MIL-STD-810 - Environmental Engineering Considerations and Laboratory Tests; 2019h, with Editorial Revision (2022).
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

**1.03 ADMINISTRATIVE REQUIREMENTS**

- A. The Automatic Temperature Controls Contractor shall coordinate with the project Balancing Contractor & Chemical Treatment Contractor for control software access necessary to facilitate the balancing & flushing processes. The Automatic Temperature Controls Contractor shall allow full building system software access to the project balancing contractor during construction and project commissioning as necessary. The Automatic Temperature Controls Contractor shall provide an override button available to the Balancing and Chemical Treatment Contractor that will drive open all control valves for the purpose of flushing & balancing the hydronic system(s). All water coils shall be opened to the system prior to the air system start-up to ensure proper mixing of glycol throughout the piping system. The Automatic Temperature Controls Contractor shall provide up to 12 hours of assistance for navigation and use of software as required.

**1.04 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Product Data and Shop Drawings: Contractor shall provide shop drawings or other submittals on all hardware, software, and installation to be provided. No work may begin on any segment of this project until submittals have been reviewed and approved for conformity with the design intent. When manufacturer's cut sheets apply to a product series rather than a specific product, the data specifically applicable to the project shall be highlighted or clearly indicated by other means. Each submitted piece of literature and drawings shall clearly reference the specification and/or drawing that the submittal is to cover. General catalogs shall not be accepted as cut sheets to fulfill submittal requirements. Submittals shall include:
    - 2. Direct Digital Control System Hardware:
      - a. A complete bill of materials of equipment to be used shall be listed indicating quantity, manufacturer, model number, and other relevant technical data.

- b. Manufacturer's description and technical data, such as performance curves, product specification sheets, and installation/maintenance instructions shall be included for all relevant items including but not limited to: direct digital controller and all controller panels; transducers/transmitters; sensors including accuracy data; actuators; valves; relays/switches; control panels; power supply; batteries; operator workstation equipment; wiring; wiring diagrams and layouts for each control panel; Schematic diagrams for all field sensors and controllers with floor plans of all sensor locations and control hardware.
3. Central System Hardware and Software
- a. A complete bill of material of equipment used indicating quantity, manufacturer, model number, and other relevant technical data.
  - b. Manufacturer's description and technical data, such as product specification sheets and installation/maintenance instructions shall be included for all relevant items including but not limited to: central processing unit (CPU); monitors; keyboard; uninterruptible power supply; interface equipment between CPU and control panels; operating system software; operator workstation software; color graphic software; and third-party software.
  - c. A schematic diagram for all control wiring, communication wiring and power wiring shall be provided. Provide a schematic drawing of the central system installation. Label all cables and ports with computer manufacturers' model numbers, function and data link protocol(s). Show all interface wiring to the control system.
  - d. Provide detailed riser diagrams of wiring between central control unit, operator workstation(s), routers, gateways and all control panels.
  - e. A list of the color graphic screens shall be provided. For each screen, provide a conceptual layout of pictures and data, and show or explain which other screens can be directly accessed.
4. Controlled Systems:
- a. A schematic diagram of each controlled system. The schematics shall have all control points/objects labeled and with point/object names shown or listed. The schematics shall graphically show the location of all control elements in the system.
  - b. A schematic wiring diagram for each controlled system. Each schematic shall have all elements labeled. Where a control element is the same as that shown on the control system schematic, it shall be labeled with the same name. All terminals shall be labeled
  - c. An instrumentation list for each controlled system. Each element of the controlled system shall be listed in table format. The table shall show element name, type of device, manufacturer, model number, and product data sheet number.
  - d. A mounting, wiring, and routing plan view drawing. The drawing shall be done in 1/4" scale. The design shall take into account HVAC, electrical and other systems' design and elevation requirements. The drawing shall show the specific location of all concrete pads and bases and any special wall bracing for panels to accommodate this work
  - e. A complete description of the operation of the control system, including sequences of operation. The description shall include and reference a schematic diagram of the controlled system.
  - f. A point/object list for each system controller including inputs and outputs (I/O), point/object number, the controlled device associated with the I/O point/object, and the location of the I/O device. Software flag points/objects, alarm points/objects, etc.
- C. Closeout Documents:
- 1. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in Owners name and registered with manufacturer.

## **1.05 QUALITY ASSURANCE**

- A. Perform work in accordance with NFPA 70.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified and with minimum three years of documented experience.
- D. Direct digital control panels shall comply with Federal Communications Commission (FCC) Regulation, Part 15, Subpart J, for Class A computing devices.
- E. All wiring shall be in accordance with the current National Electrical Code and all local electrical codes.
- F. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for purpose specified and indicated.

## **1.06 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Correct defective Work within a two year period after Substantial Completion.
- C. Provide five year manufacturer's warranty for field programmable micro-processor based units.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Trane

### **2.02 SYSTEM DESCRIPTION**

- A. An existing DDC building automation system manufactured by Trane is currently in the building. The system shall be expanded to accommodate the new work under this project including but not limited to:
  - 1. Expand the existing network to accommodate the additional points and communication.
  - 2. Upgrade the existing controls system to current versions. Upgrade all existing unit controllers to provide one unified control system (one point of access).
  - 3. Upgrade and add graphics for additional control points, integrating both existing graphics and new graphics into a unified interface.
  - 4. Provide additional processing power and memory for additional points.
- B. Automatic temperature control field monitoring and control system using field programmable micro-processor based units.
- C. Base system on distributed system of fully intelligent, stand-alone controllers, operating in a multi-tasking, multi-user environment on token passing network, with central and remote hardware, software, and interconnecting wire and conduit.
- D. Include computer software and hardware, operator input/output devices, control units, local area networks (LAN), sensors, control devices, actuators.
- E. Controls for variable air volume terminals, radiation, reheat coils, unit heaters, fan coils, and the like when directly connected to the control units. Individual terminal unit control is specified in Section 23 0913.
- F. Provide control systems consisting of thermostats, control valves, dampers and operators, indicating devices, interface equipment and other apparatus and accessories required to operate mechanical systems, and to perform functions specified.
- G. Include installation and calibration, supervision, adjustments, and fine tuning necessary for complete and fully operational system.

### 2.03 OPERATOR INTERFACE

- A. The operator workstation software shall be a graphical user interface (GUI). The system shall allow display of up to 10 dynamic and animated graphic screens at once for comparison and monitoring of system status. Provide a method for the operator to easily move between graphic displays and change the size and location of graphic displays on the screen. The system graphics shall be able to be modified while on-line. An operator with the proper password level shall be able to add, delete, or change dynamic objects on a graphic. Dynamic objects shall include analog and binary values, dynamic text, static text, and animation files. Graphics shall have the ability to show animation by shifting image files based on the status of the object.
- B. Custom graphic files shall be created with the use of a graphics generation package furnished with the system. The graphics generation package shall be a graphically based system that uses the mouse to create and modify graphics. The graphics generation package also shall provide the capability of capturing or converting graphics from other programs such as Visio or AutoCAD.
- C. Furnish a complete library of standard HVAC equipment graphics such as chillers, boilers, air handlers, terminals, fan coils, and unit ventilators. This library also shall include standard symbols for other equipment including fans, pumps, coils, valves, piping, dampers, and ductwork. The library shall be furnished in a file format compatible with the graphics generation package program. Graphics shall be created by drag-and-drop selection of graphic symbols and drag-and-link with BACnet objects with dynamic and interactive display fields.
- D. Each workstation shall provide operator interface and off line storage of system information. Provide the following applications at each workstation:
  - 1. Each workstation shall store on the hard disk a copy of the current database of each Building Controller. This database shall be updated whenever an operator initiates a save command. A system operator with the proper password clearance shall be able to save the database from any system panel. The operator shall be able to clear a panel database via the network and may initiate a download of a specified database to any panel in the system from the network.
  - 2. The workstation software shall provide a method of configuring the system. This shall allow for future system changes or additions by users under proper password protection. Each operator shall be required to log on to the system with a user name and password in order to view, edit, add, or delete data. System security shall be selectable for each operator. The system supervisor shall have the ability to set passwords and security levels for all other operators. Each operator password shall be able to restrict the functions accessible to viewing and/or changing each system application.
  - 3. Any object in the system shall be configurable to alarm in and out of normal state. The operator shall be able to configure the alarm limits, alarm limit differentials, states, and reactions for each object in the system. Alarm messages shall alert the operator in such a way that the operator will be able to recognize the source, location, and nature of the alarm without relying upon acronyms or other mnemonics. The operator shall be able to determine (by object) what, if any, actions are to be taken during an alarm.
  - 4. The operator shall be able to define a custom trend log for any data object in the system. Trend data shall be sampled and stored on the Building Controller panel, and be archived on the hard disk for use in spreadsheets and standard database programs. The operator shall be able to view all system alarms and change of states from any location in the system. Events shall be listed chronologically. An operator with the proper security level may acknowledge and clear alarms.
  - 5. Provide a method for the operator to view, and edit if applicable, the status of any object and property in the system. The status shall be available by menu, on graphics, or through custom programs.

- E. Each PC workstation shall support editing of all system applications. Provide editors for each application at the PC workstation. The applications shall be downloaded and executed at one or more of the controller panels.
  - 1. Provide an editor for each type of application that shall allow the operator to view and change the configuration, name, control parameters, and set points for all controllers.
  - 2. An editor for the scheduling application shall be provided at each workstation. Provide a method of selecting the desired schedule and month. This shall consist of a monthly calendar for each schedule. Exception schedules and holidays shall be shown clearly on the calendar. Provide a method for allowing several related objects to follow a schedule. The start and stop times for each object shall be adjustable from this master schedule.
  - 3. Provide the tools to create, modify, and debug custom application programming. The operator shall be able to create, edit, and download custom programs at the same time that all other system applications are operating. The system shall be fully operable while custom routines are edited, compiled, and downloaded.

#### **2.04 BAS SYSTEM ARCHITECTURE**

- A. Automation Network
  - 1. The automation network shall be based on a PC industry standard of Ethernet TCP/IP. Where used, LAN controller cards shall be standard "off the shelf" products available through normal PC vendor channels. Automation network shall support both IPv4 and IPv6 protocols.
  - 2. A temporary Automation network solution will be required to be installed by the BMS Contractor prior to the completion of the Owner's IT network. The temporary network shall provide remote access to the BMS for programming, commissioning, graphics loading and binding, and for access by the contract team. The temporary network shall link together all Network Engines via ethernet CAT6 cable and temporary un-managed switches. One Network Engine shall serve as the system "Master" and shall have a cellular modem to communicate with a remote cloud-based server that is used for all functionality outlined. Once the Owner's IT network is installed and commissioned, the temporary network shall be de-commissioned and Owner's IT data drops shall be permanently connected to the BMS Server, all Network Engines and Ring Management appliances. The database from the temporary server shall be transferred to the permanent server and checked for proper on premises operation.

#### **2.05 NETWORK & IT INTEGRATION**

- A. Network Security - To protect the BMS from unauthorized users and computer hackers the Automation Network shall support HTTPS with TLS 1.2 between components, including the Application and Data Server(s), Network Engines, Mobile User Interface and Site Management Portal. Self-signed certificates are installed on supported products, with the option of configuring trusted certificates. Computing devices supplied by the BMS vendor will automatically shut down unused ports to deter unauthorized access. BMS server, network engines, and network control engines shall support port authentication and managed certificates via 802.1X. Device certificates shall be managed by the IT department.
- B. The automation network will be compatible with other enterprise-wide networks. The automation network shall utilize the Owner's IT enterprise network as the BMS primary communications "backbone". Owner or Owner's IT installer shall provide all data drops to the BMS supervisory engines, server, and ring manager appliances. The BMS contractor shall furnish and install all ethernet cable to serve all field controllers and other BACnet IP connected equipment.

#### **2.06 WEB BROWSER INTERFACE**

- A. The system shall be capable of supporting an unlimited number of clients using a standard Web browser. The Web browser software shall run on any operating system and system

configuration that is supported by the Web browser. Systems that require specific machine requirements in terms of processor speed, memory, etc., in order to allow the Web browser to function with the BAS, shall not be acceptable. The Web browser shall provide the same view of the system, in terms of graphics, schedules, calendars, logs, etc., and provide the same interface methodology as is provided by the Graphical User Interface. Systems that require different views or that require different means of interacting with objects such as schedules, or logs, shall not be permitted.

- B. The Web browser client shall support user log-on identification and password. Security using Java authentication and encryption techniques to prevent unauthorized access shall be implemented.
- C. Provide a minimum of three (3) separate log-ins reserved for the owner and a minimum of five (5) log-ins reserved for service technicians. Coordinate log-ins with owner during system start-up and training.
- D. Graphical screens developed for the GUI shall be the same screens used for the Web browser client. Any animated graphical objects supported by the GUI shall be supported by the Web browser interface. HTML programming shall not be required to display system graphics or data on a Web page. HTML editing of the Web page shall be allowed if the user desires a specific look or format. Storage of the graphical screens shall be in the Server, without requiring any graphics to be stored on the client machine. Systems that require graphics storage on each client PC are not acceptable.
- E. Real-time values displayed on a Web page shall update automatically without requiring a manual “refresh” of the Web page.
- F. Users shall have administrator-defined access privileges. Depending on the access privileges assigned, the user shall be able to modify common application objects, such as schedules, calendars, and set points in a graphical manner. Holidays shall be set by using a graphical calendar, without requiring any keyboard entry from the operator.
- G. No entry of text shall be required for Commands to start and stop binary objects.
- H. The system shall provide the capability to specify a user’s (as determined by the log-on user identification) home page. Provide the ability to limit a specific user to just their defined home page. From the home page, links to other views, or pages in the system shall be possible, if allowed by the system administrator.
- I. Graphic screens on the Web Browser client shall support hypertext links to other locations on the Internet or on Intranet sites, by specifying the Uniform Resource Locator (URL) for the desired link.

## **2.07 CONTROLLERS**

- A. General Requirements:
  - 1. For all controllers, provide password protected access for local or remote access of controllers to modify programming in addition to setpoint changes.
  - 2. The ethernet equipment controller shall employ finite state programming to eliminate unnecessary conflicts between control functions at crossover points in their operational sequences. Suppliers using non-state based DDC shall provide separate control strategy diagrams for all controlled functions in their submittals.
  - 3. Ethernet equipment controllers shall be factory programmed with a continuous adaptive tuning algorithm that senses changes in the physical environment and continually adjusts loop tuning parameters appropriately. Controllers that require manual tuning of loops or perform automatic tuning on command only shall not be acceptable.
  - 4. Secure Boot – The Network Engine(s) shall prevent malicious or unauthorized software applications from loading during the system startup process.
  - 5. User Authentication – The Network Engine(s) shall support local user authentication.

6. Password Security – Access to the Network Engines’ embedded user interface shall require a password of 8 to 50 characters including a minimum of one lower case letter, one upper case letter, one number, and one special character. An alarm shall be generated after three unsuccessful attempts within 15 minutes, and the user shall be denied access until permission is renewed by a system administrator.
  7. Network Security – Communication between the Network Engine and other system networked devices including additional Network Engines, Application and Data Servers, Open Data Servers (BACnet listed OWS), and user interface clients shall be encrypted and support HTTPS with Transport Level Security (TLS) Version 1.2. Self-signed certificates are to be provided with the option of configuring trusted certificates.
  8. Hardware Real Time Clock – The Network Engine(s) shall include an integrated, hardware-based, real-time clock, with a supercapacitor to maintain time for a minimum of 72 hours during a power loss. Controllers using a battery to maintain time during a power loss shall not be acceptable.
- B. SUPERVISORY NETWORK CONTROLLERS:
1. Supervisory network controllers shall be used to manage and schedule global control strategies on the network and communicate with the local Operator’s Workstation. A minimum of one (1) supervisory network controller shall be used for the direct digital control system. Each supervisory network controller shall include its own microprocessor, program and data memory, power supply, network communications module, and battery. Supervisory network controllers may also include input/output modules and shall be capable of sharing its point and data information with other controllers on the network.
- C. EQUIPMENT CONTROLLERS:
1. Equipment controllers shall be used to control all large HVAC equipment such as air handling units, central heating plant equipment, central cooling plant equipment, etc. A minimum of one (1) equipment controller shall be used for each air handling unit.
  2. Each equipment controller shall include its own microprocessor, program and data memory, power supply, input/output modules, and battery. All program and data memory shall be read/write random access memory (RAM) type with battery backup. The battery shall be self-charging and capable of supporting all memory within the controller for a minimum of seventy-two (72) hours if commercial power to the unit is interrupted. Upon the resumption of normal power, the runtime control software shall analyze the status of all controlled equipment, compare it with normal occupancy scheduling, and turn equipment on or off as necessary to resume normal operation.
  3. Each equipment controller shall be capable of sharing point and data information with other controllers, such that control sequences or control loops executing in one controller may receive input signals from sensors connected to other controllers on the network. If the network communication link fails or the originating controller malfunctions, the control loop shall continue to function using the last value received from the failed controller. Failure of one controller shall have no other effect upon any of the other controllers in the network.
  4. This contractor shall provide a NEMA 1 enclosure for any controllers furnished.
  5. Terminal unit controllers shall be used to control all small HVAC terminal unit equipment such as variable air volume boxes, dual duct boxes, heat pumps, fan coil units, unit ventilators, terminal coils, etc. A minimum of one (1) terminal unit controller shall be used for each terminal unit.
- D. TERMINAL UNIT CONTROLLERS:
1. Terminal unit controllers shall be used to control all small HVAC terminal unit equipment such as variable air volume boxes, dual duct boxes, heat pumps, fan coil units, unit ventilators, terminal coils, etc. A minimum of one (1) terminal unit controller shall be used for each terminal unit.

2. This contractor shall provide a NEMA 1 enclosure for any controllers furnished.
3. Each terminal unit controller shall include its own microprocessor, program and data memory, power supply, input/output modules, and battery. All program and data memory shall be read/write random access memory (RAM) type with non-volatile memory similar to EEPROM (Electrically Erasable Programmable Read-Only memory). Upon the resumption of normal power, the runtime control software shall analyze the status of all controlled equipment, compare it with normal occupancy scheduling, and turn equipment on or off as necessary to resume normal operation.
4. Each terminal unit controller shall be capable of sharing point and data information with other controllers, such that control sequences or control loops executing in one controller may receive input signals from sensors connected to other controllers on the network. If the network communication link fails or the originating controller malfunctions, the control loop shall continue to function using the last value received from the failed controller. Failure of one controller shall have no other effect upon any of the other controllers in the network.

## **2.08 POWER SUPPLIES AND LINE FILTERING**

- A. Power Supplies:
  1. Provide UL listed control transformers with Class 2 current limiting type or over-current protection in both primary and secondary circuits for Class 2 service as required by the NEC.
  2. Limit connected loads to 80 percent of rated capacity.
  3. Match DC power supply to current output and voltage requirements.
  4. Unit to be full wave rectifier type with output ripple of 5.0 mV maximum peak to peak.
  5. Regulation to be 1 percent combined line and load with 100 microsecond response time for 50 percent load changes.
  6. Provide over-voltage and over-current protection to withstand a 150 percent current overload for 3 seconds minimum without trip-out or failure.
  7. Operational Ambient Conditions: 32 to 120 degrees F.
  8. EM/RF meets FCC Class B and VDE 0871 for Class B and MIL-STD-810 for shock and vibration.
  9. Line voltage units UL recognized and CSA approved.
- B. Power Line Filtering:
  1. Provide external or internal transient voltage and surge suppression component for all workstations and controllers.
  2. Minimum surge protection attributes:
    - a. Dielectric strength of 1000 volts minimum.
    - b. Response time of 10 nanoseconds or less.
    - c. Transverse mode noise attenuation of 65 dB or greater.
    - d. Common mode noise attenuation of 150 dB or greater at 40 to 100 Hz.

## **2.09 BACNET CAPABILITIES**

- A. BACnet Interoperability Building Blocks (BIBBS) for each DDC system component (network or system level controller) proposed. BACnet is not required for unitary or equipment controllers.
- B. Communication shall be through a translator/gateway that maintains the BACnet protocol.
- C. The unitary or equipment controller supplier shall provide a list confirming their support for all mandatory data, and identifying which optional network variables and configuration properties they support.
- D. Certification shall be verified through the BIBBS statement for the BACnet Certification Authority.

- E. BACnet shall communicate over an Ethernet connection at the system level and conform to ASHRAE Std 135.
- F. Contractor shall map all available Bacnet points for each applicable piece of equipment at discretion of project engineer and owner.

## **2.10 SYSTEM SOFTWARE**

- A. All necessary runtime control software to form a complete operating system as described in this specification shall be provided. The software programs specified in this section shall be provided as an integral part of the direct digital controllers and shall not be dependent upon any higher level computer for execution.
- B. The runtime control software in the equipment controllers and terminal unit controllers shall have the ability to perform the following pre-tested control algorithms and control functions:
  1. Control Loops (two-position, proportional, PI, PID)
  2. Outdoor Air Reset Control
  3. Minimum On/Off Times
  4. Random Start Delay
  5. Night Setback/Setup Control
  6. Simultaneous Heating/Cooling Lockout
  7. Point History Collection
  8. Alarm Reporting
  9. Change of Value Reporting
- C. Point History Collection shall provide a record of value of analog I/O points over the last 72 hours, at 30-minute intervals, and a record of the last 50 status changes for binary type points with the capability of archiving data after that.
- D. Runtime control software in the supervisory network controllers shall have the ability to perform any or all of the following system and energy management routines:
  1. Time of Day, Calendar Based, and Holiday Scheduling
  2. Trending
  3. Optimum Start and Stop
  4. Peak Demand Limiting
  5. Chiller Plant Optimization
- E. All programs shall be executed automatically without the need for operator intervention, and shall be flexible enough to allow user customization. Programs shall be applied to building equipment as described in the Sequence of Operation.
- F. Custom Process Programming Capability: Runtime control software shall be able to execute custom, job-specific processes defined by the user, to automatically perform calculations and special control routines.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that conditioned power supply is available to the control units and to the operator work station. Verify that field end devices, wiring, and pneumatic tubing is installed prior to installation proceeding.

### **3.02 INSTALLATION**

- A. Install control units and other hardware in position on permanent walls where not subject to excessive vibration.
- B. Install software in control units and in operator work station. Implement all features of programs to specified requirements and appropriate to sequence of operation. Refer to Section 23 0993.

- C. Provide required line voltage wiring including breakers, conductors, conduit, transformers, disconnects and all required accessories to support control systems.
- D. Provide conduit and electrical wiring in accordance with Section 26 0583. Electrical material and installation shall be in accordance with appropriate requirements of Division 26.
- E. Controllers shall be mounted in NEMA 1 enclosures near the equipment served. If multiple controllers are installed in a single enclosure, the controller shall be noted as to the location and equipment served along with a tag on the controlled equipment as to the location of the controller if not within the same room.
- F. Install software in direct digital control panels and Operator's Workstation. Implement all features of programs to specified requirements and appropriate to sequence of operation.
- G. Connect and configure equipment and software to achieve the sequence of operation specified.
- H. Verify location of room sensors, thermostats, humidistats, and other exposed control sensors with plans and room details before installation. Locate 48 inches above floor.
- I. Install averaging elements in ducts and plenums in crossing or zigzag pattern.
- J. Install damper motors on outside of duct in warm areas, not where exposed to outdoor temperatures.
- K. Install labels and nameplates to identify control components including the following:
  - 1. Control cabinet nameplates
  - 2. Control valve tags
  - 3. Control damper labels
  - 4. Sensor tags

### **3.03 CONNECTION TO OWNER'S DATA SYSTEM**

- A. This contractor shall be responsible for the installation of all data wiring, conduit, terminations, etc., to connect the temperature controls system into the owner's data network. This contractor shall coordinate the location of the data system connection point, network protocols, and network address with the owner's IT personnel before starting work.
- B. If multiple data connections are required (i.e., multiple ATC panel locations), the ATC contractor shall be responsible for each of the connections necessary.
- C. All costs associated with the installation of the required data connections shall be borne by this contractor.

### **3.04 BACNET CONNECTIONS TO OTHER EQUIPMENT**

- A. This contractor shall coordinate the BACnet protocol and all wiring between the temperature control system and furnished equipment manufacturer.
- B. This contractor shall coordinate the connection protocol (MS/TP or IP) with the equipment manufacturer and/or supplier.
- C. This contractor shall be responsible for the installation of all data wiring, conduit, terminations, etc., to connect the temperature controls system into equipment control panel. This contractor shall coordinate the location of the data system connection point, network protocols, and network address before starting work.
- D. All costs associated with the installation of the required data connections shall be borne by this contractor.

### **3.05 ELECTRICAL WIRING AND CONNECTIONS**

- A. Installation of raceways, boxes, cabinets, wire and cable shall meet or exceed NEC, latest edition.

- B. All cabling in mechanical rooms, down walls to thermostat boxes, and any exposed areas (i.e. gymnasiums, auditoriums, etc) shall be housed in conduit. Areas above concealed ceiling spaces without conduit on the cabling shall have wiring supported from structure above, Wire will not be allowed to lay free on the ceiling/space.
- C. Provide electrical conduit seals to close off openings into the electrical boxes behind any thermostat or sensor. This shall include sealing the conduit after wiring installation. Contractor shall evaluate each box location and insulate the inside of the box if necessary.
- D. All conduit installed as part of the temperature controls system shall be Blue in color.
- E. Control wiring when installed above the ceiling shall be furnished with a plenum rated jacket. Wiring may be placed in cable tray where available.
- F. Fasten flexible conductors, bridging cabinets and doors, neatly along hinge side; protect against abrasion. Tie and support conductors neatly.
- G. Number-code or color-code conductors except local individual room controls, for future identification and servicing of control system.
- H. Connect electrical components to wiring systems and to ground as indicated and instructed by manufacturer. Tighten connectors and terminals, including screws and bolts, according to equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torque requirements are not indicated, tighten connectors and terminals according to tightening requirements specified in UL 486A.
- I. Connect manual reset limit controls independent of manual control switch positions. Automatic duct heater resets may be connected in interlock circuit of power controllers.
- J. Connect HAND-OFF-AUTO selector switches to override automatic interlock controls when switch is in HAND position.

### **3.06 MANUFACTURER'S FIELD SERVICES**

- A. Start and commission systems. Allow sufficient time for start-up and commissioning prior to placing control systems in permanent operation.
- B. Provide service engineer to instruct Owner's representative in operation of systems plant and equipment for 3 day period.
- C. Provide basic operator training for four persons on data display, alarm and status descriptors, requesting data, execution of commands and request of logs. Included in the total training time listed below, 4-8 hours shall be dedicated to mapping and displaying Bacnet points for all applicable equipment in coordination with the owner. Include a minimum of 40 hours dedicated instructor time. Provide training on site.

### **3.07 DEMONSTRATION AND INSTRUCTIONS**

- A. Demonstrate complete and operating system to Owner.
- B. Manufacturer's Field Services: Provide the services of a factory-authorized service representative to demonstrate and train Owner's maintenance personnel as specified below.
- C. Train Owner's maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, and preventive maintenance.
- D. Provide operator training on data display, alarm and status descriptors, requesting data, execution of commands, and request of logs. Schedule training with Owner with at least 7 days' notice.

### **3.08 MAINTENANCE**

- A. See Section 01 7000 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.

- B. Provide service and maintenance of energy management and control systems for one years from Date of Substantial Completion.
- C. Provide two complete inspections, one in each season, to inspect, calibrate, and adjust controls as required, and submit written reports.
- D. Provide complete service of systems, including call backs. Make minimum of four complete normal inspections of approximately two hours duration in addition to normal service calls to inspect, calibrate, and adjust controls, and submit written reports.

### **3.09 COMMISSIONING**

- A. Manufacturer's Field Services: Provide the services of a factory-authorized service representative to start control systems.
- B. Test and adjust controls and safeties. Recalibrate all sensors where wiring lengths effect sensor readings.
- C. Replace damaged or malfunctioning controls and equipment.
- D. Start, test, and adjust control systems.
- E. Demonstrate compliance with requirements.
- F. Adjust, calibrate, and fine tune circuits and equipment to achieve sequence of operation specified.

**END OF SECTION**

**SECTION 23 3100  
HVAC DUCTS AND CASINGS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Metal ducts.
- B. Flexible ducts.
- C. Nonmetal ducts.

**1.02 REFERENCE STANDARDS**

- A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.
- B. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2021.
- C. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.
- D. SMACNA (LEAK) - HVAC Air Duct Leakage Test Manual; 2012.

**1.03 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Product Data: Provide data for duct materials.
- C. Closeout Documents:
  - 1. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate per appropriate seal class, following SMACNA (LEAK).
  - 2. Project Record Documents: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

**1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience, and approved by manufacturer.

**1.05 FIELD CONDITIONS**

- A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.
- B. Maintain temperatures within acceptable range during and after installation of duct sealants.

**PART 2 PRODUCTS**

**2.01 GENERAL REQUIREMENTS**

- A. Provide UL Class 1 ductwork, fittings, hangers, supports, and appurtenances in accordance with NFPA 90A and SMACNA (DCS) guidelines unless stated otherwise.
- B. Acoustical Treatment: Provide sound-absorbing liners and sectional silencers for metal-based ducts in compliance with Section 23 3319.
- C. Duct Material in accordance with Allowed Static Pressure Range:
  - 1. Medium Pressure Supply (from supply fan to VAV inlet): 4 in-wc, galvanized steel
  - 2. Low Pressure Supply (from VAV outlet to air outlet): 2 in-wc, galvanized steel
  - 3. Return and Relief: 2 in-wc, galvanized steel
  - 4. General Exhaust: 2 in-wc, galvanized steel
  - 5. Outside Air Intake: 2 in-wc, galvanized steel
  - 6. Transfer Air and Sound Boots: 1 in-wc, galvanized steel
- D. Duct Sealing and Leakage in accordance with Static Pressure Class:

1. As indicated above for duct material pressure class.
- E. Duct Fabrication Requirements:
1. Duct and Fitting Fabrication and Support: SMACNA (DCS) including specifics for continuously welded round and oval duct fittings.
  2. Ductwork shall be fabricated of minimum 26 gauge galvanized metal.
  3. Size round duct installed in place of rectangular ducts in accordance with ASHRAE (FUND) Handbook - Fundamentals.
  4. Use reinforced and sealed sheet-metal materials at recommended gauges for indicated operating pressures or pressure class.
  5. Construct tee's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows must be used, provide air foil turning vanes of perforated metal with glass fiber insulation when acoustical lining is indicated or required. Short radius elbows (1 times duct width) shall be allowed if a single radius turning vane is installed at 1/3 width-distance from the inner radius.
  6. Provide turning vanes of perforated metal with glass fiber insulation when acoustical lining is indicated or required.
  7. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
  8. Provide transitions in duct size from trunk or runout ducts shown on the drawings to the inlet dimensions of any device connected to the duct. Transitions shall be sealed air tight.
  9. Water tight drip pans shall be provided below all power vent, relief vent, gravity vent, fresh air and exhaust openings through roof, either built into the ductwork or, if no duct is installed, independently suspended below opening.

## 2.02 METAL DUCTS

- A. Material Requirements:
1. Galvanized Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating.

B. Round Ducts

1. All supply duct shall be round spiral lockseam construction. Round duct shall be of standard spiral gauge as follows:

duct diameter	0-2 inches water column	>2-4 inches water column
Up to 8 inch	28 gauge	26 gauge
9 to 14 inch	28 gauge	26 gauge
15 to 26 inch	26 gauge	24 gauge
27 to 36 inch	24 gauge	22 gauge
37 to 42 inch	22 gauge	20 gauge
44 to 50 inch	22 gauge	20 gauge
52 to 60 inch	20 gauge	18 gauge
62 to 84 inch	18 gauge	18 gauge

2. Lockseam or 'Snappy' fittings and pipe shall not be allowed on any exposed round ductwork.
3. Duct shall be provided in continuous lengths, except where interrupted by fittings or diffuser takeoffs.
4. All branch takeoffs shall be made using high efficiency type takeoff fittings.
5. For all round ductwork up to and including 16" diameter, the duct sections shall be joined using a premanufactured coupling connection. When a connection is made, it shall be done by first coating the inside of the two pieces of ductwork thoroughly for approximately 3" with duct sealant. Duct sealant shall be used on fresh air ductwork & all outside & relief

air ductwork within 15' of building penetration as well as ductwork located in an attic space. Sealant shall be UL 181B-M listed and have a service range of -20 degrees F to 200 degrees F. The connector shall then be slid on so that the sealant is located between the outside wall of the connector and the inside wall of the ductwork. The coupling connection shall be attached to both pieces of ductwork it is connecting with either screws or rivets.

6. For all round ductwork 18" diameter and larger, the duct sections shall be joined together using a premanufactured Flange with Barrel Clamp type connector. Provide a neoprene gasket between the flanges to prevent air leakage. When a connection is made, it shall be done by first coating the inside of the two pieces of ductwork thoroughly for approximately 1-1/2 inches, or the length of the flanged connection, with Ductmate Proseal, indoor/outdoor, water based sealer, with 0 flame/smoke rating equal. Duct sealant shall be used on fresh air ductwork & all outside & relief air ductwork within 15' of building penetration as well as ductwork located in an attic space. Sealant shall be UL 181B-M listed and have a service range of -20 degrees F to 200 degrees F. The flanged connectors shall then be slid on so that the sealant is located between the outside wall of the flanged connectors and the inside wall of the ductwork. The flanges shall be connected to both duct pieces with screws, rivets, or by spot welding.
7. Wire rope hanging system may be used for support of round and/or ovalductwork. System shall be similar to Ductmate Cable Shark or Grippl. System shall consist of wire rope material with a locking mechanism for wire adjustment. Locking mechanism shall be installed according to manufacturer's recommendations. Top termination of hanger shall be in accordance with SMACNA Standards.
8. Acceptable manufacturers include Norlock, Semco, Tangent Air, United McGill, Sheet Metal Connectors or approved equal.

### **2.03 JOINT SEALERS AND SEALANTS**

- A. Joint Sealers and Sealants: Non-hardening, water resistant, mildew and mold resistant.
  1. Type: Heavy mastic or liquid used alone or with tape, suitable for joint configuration and compatible with substrates, and recommended by manufacturer for pressure class of ducts. Sealant shall be gray in color or a color matching the duct system on which it is applied.
  2. All fresh air intake and relief air ductwork between louver/hood and air handling unit shall have all joints sealed watertight. Sealant shall be UL 181B-M listed and have a service range of -20 degrees F to 200 degrees F.
  3. All joints of low-pressure duct shall be carefully sealed to eliminate air leakage. Sealer shall be spread on the inside of all slips and longitudinal joints and then the duct assembled. Sealer shall be applied to all screw heads, connecting laps, and corner joints as well as all joints of flexible duct. Sealer shall be suitable for indoor/outdoor HVAC duct systems and shall be applied in accordance with manufacturer's recommendations. Duct sealants shall be U.L. Classified with a flame spread rating of 25 or less and a smoke developed rating of 50 or less. Sealants shall be UL 181B-M listed and have a service range of -20 degrees F to 200 degrees F
  4. Surface Burning Characteristics: Flame spread index of zero and smoke developed index of zero, when tested in accordance with ASTM E84.
  5. Manufacturers:
    - a. Carlisle HVAC Products; Hardcast Iron-Grip 601 Water Based Duct Sealant: [www.carlislehvac.com/sle](http://www.carlislehvac.com/sle).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

### **2.04 FLEXIBLE DUCTS**

- A. Flexible Ducts: UL 181, Class 1, multiple layers of aluminum laminate supported by helically wound spring steel wire.

1. Flexible duct shall meet NFPA 90A and 90B requirements and be UL listed 181 Class 1 Air Duct with a flame spread less than 25 and smoke developed less than 50.
2. Insulation: Fiberglass R-6.0 insulation with polyethylene vapor barrier film.
3. Maximum Velocity: 6000 fpm.
4. Temperature Range: Minus 20 degrees F to 210 degrees F.
5. Flex duct shall only be used in locations explicitly indicated on the drawings (generally limited supply air device connections and limited to 5 foot length without change in direction).
6. Flex duct shall not be used above inaccessible ceilings.
7. No flexible "duct connectors" shall be allowed.
8. Manufacturers:
  - a. Wiremold.
  - b. Thermaflex.
  - c. Flexmaster.
  - d. Atco.

## **2.05 NON-METAL DUCTS**

- A. Underfloor Ducts and Slab Openings:
  1. Ductwork shall be classified as a HDPE ductwork material mixed with a safe gaseous blowing agent when manufacturing (R-10 insulation equivalent). All fittings are manufactured similarly through a roto-modeling process. All fittings, boots, and duct sections and connectors should be constructed of Polyethylene material.
  2. All duct take-offs, branches and boots up to floor registers shall be of the same material as the primary duct. No sheet metal will be allowed under the floor, unless encased in concrete.
  3. Openings in concrete slab for floor grilles or registers in sizes not furnished in the same material as the ductwork shall be made using rectangular sleeves constructed of not less than 18 gauge sheet metal and of size as required for the grilles or registers noted. Sleeves shall be capped and internally supported to prevent distortion during the pouring of concrete.
  4. Underground ductwork being encased in concrete shall be secured with earth anchors to prevent the duct from rising during the concrete fill process. Installation when encasing in concrete shall be completed in compliance with manufacturers recommendations.
  5. All joints shall be gasket and sealed with screws or clamps per manufactures instructions. Ductwork installations shall be pressure tested prior to connection to fans and prior to knockouts for final connections and after allowing 24 hours for sealing joint sealants to cure.
  6. All tests should be done according to manufactures instructions testing procedures.
  7. All underground duct shall be installed in accordance with the requirements of the State Building Code.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install, support, and seal ducts in accordance with SMACNA (DCS).
- B. All branch takeoffs shall be made using high efficiency type takeoff fittings similar to Sheet Metal Connectors Super HETO. All takeoffs shall be provided with a manual volume damper.
- C. Install products following the manufacturer's instructions.
- D. During construction, provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering the ductwork system.
- E. Flexible Ducts: Connect to metal ducts with duct sealer on inside and outside of flex duct as well as strap clamp around duct end. Tape outer jacket to diffuser neck..

- F. Where duct liner is installed in ducts, the duct size indicated accommodates the liner such that the gross duct dimension is that shown on the drawings. No increase in duct size is necessary to accommodate duct liner thickness.
- G. Provide openings in ductwork as indicated to accommodate thermometers and controllers. Provide pilot tube openings as indicated for testing of systems, complete with metal can with spring device or screw to insure against air leakage. For openings, insulate ductwork and install insulation material inside a metal ring.
- H. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
- I. Use double nuts and lock washers on threaded rod supports.
- J. Provide galvanized iron drip pans under water, soil, waste, drain or heating system piping which runs over electric switchboards, elevator controllers, or electric motor starters. Drip pans shall have all joints and seams soldered water tight. Each drip pan shall have a drain piped to discharge where shown on the drawings, or if not shown, to discharge over nearest available drain.
- K. Excavation, Trenching, and Backfilling for underground ductwork:
  - 1. Excavation and Trenching: The bottom of trenches shall be tamped hard and graded to secure required fall. Bell holes shall be excavated so that duct shall rest on solid ground for its entire length. Rock, where encountered, shall be excavated to a depth of six (6) inches below the bottom of the duct, and before duct is laid, the space between the bottom of the duct and the rock surface shall be filled with gravel. All surplus excavating materials shall be removed from the job site to location directed by the Architect.
  - 2. Filling and Backfilling - Interior: Refer to manufacturer's instructions for filling and backfilling for installation of underground ductwork.
  - 3. Tests shall be made at expense of the Contractor by an approved testing laboratory, to determine adequacy of compaction. These tests shall be made during the compaction operation at various levels to insure uniformity of compaction and test reports shall show elevation as well as location of tests. The testing laboratory inspector shall be on the site at intervals during all major backfilling operations. Compaction tests shall be made at locations as directed by Architect.
  - 4. Cracked and/or damaged floor slabs, walls or partitions resulting from improper compaction of fill materials shall be repaired or replaced, as directed by Architect, at the Contractor's expense.
- L. Sealing of Ductwork:
  - 1. Joints of all supply, return and exhaust ducts shall be carefully sealed to eliminate air leakage. Sealer shall be spread on the inside of all slips and longitudinal joints and then duct assembled. Sealer shall also be applied to exterior to all joints. Sealant shall be UL 181B-M listed and have a service range of -20 degrees F to 200 degrees F.
  - 2. Seal all ductwork to seal class A. This will require all ductwork to have all joints, seams and wall penetrations sealed. Sealing must be sufficient to achieve a leakage class 6. This means that 6 CFM of leakage per 100 sq ft of duct surface is the maximum allowable threshold if tested at 1 inch test pressure. See additional duct sealing requirements in the latest edition of the SMACNA manual "HVAC Air Duct Leakage Test Manual."
  - 3. If review of the testing and balancing report reveals duct leakage in excess of the leakage class 6, the contractor shall be required to seal the ductwork in place. Duct sealing shall be as follows:
    - a. Repair all major leakage sites (> ½ inch across) using mastic and fiberglass mesh tape.
    - b. Assure the structural integrity of all mechanical joints of existing ductwork using mastic and fiberglass mesh tape.
    - c. Seal existing ductwork from the inside using automated, UL Certified, aerosolized sealant injection as manufactured by AeroSeal

- d. Protect air-moving equipment, air inlets and outlets, and other devices and appurtenances as recommended by the manufacturer.
  - e. Protect occupied spaces from aerosol particles using manufacturer procedures.
  - f. Provide pre-sealing, post-sealing and sealing profile certificates for all sections sealed.
  - g. Seal all injection and test holes in existing ductwork using patching plates sealed with mastic.
  - h. Any insulation (internal or external) shall be replaced on the patching plate.
4. Sealant shall be applied neatly. Satisfactory appearance shall be maintained on all exposed ductwork.
- M. Testing and Adjusting
- 1. The supply, return and exhaust ductwork shall be pressure tested by Mechanical Contractor to assure minimal duct leakage. The Testing and Balancing sub-contractor shall supply testing equipment for this contractor to pre-test all ductwork prior to the Testing and Balancing sub-contractors verification of leakage. It shall be the Mechanical Contractor's responsibility to coordinate and schedule duct installation and the associated pressure testing with the testing and balancing sub-contractor, prepare all ductwork for leak testing, and to make all necessary modifications to the ductwork to meet the duct air tightness requirements as stated herein and as recommended by the Testing and Balancing Contractor.
  - 2. An extra set of Mechanical drawings shall be supplied to the Testing and Balancing Contractor at the beginning of the project, so that the leak testing percentages can be written on the print for each section of ductwork during the leak testing process. Depending upon capacity of testing equipment, the exact size and length of duct sections that can be tested will vary. Confirm and coordinate duct section sizes with Testing and Balancing sub-contractor. Progress reports of pressure testing shall be submitted at intervals of 25%, 50%, 75% and 100% of work completed. Refer to Section 23 0593 - Testing, Adjusting, and Balancing for HVAC of these specifications for more information.

**END OF SECTION**

**SECTION 23 3300  
AIR DUCT ACCESSORIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Backdraft dampers - metal.
- B. Duct access doors.
- C. Duct test holes.
- D. Fire dampers.
- E. Volume control dampers.
- F. Miscellaneous Products:
  - 1. Internal strut end plugs.
  - 2. Duct opening closure film.

**1.02 REFERENCE STANDARDS**

- A. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2021.
- B. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.
- C. UL 555 - Standard for Fire Dampers; Current Edition, Including All Revisions.

**1.03 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Product Data: Provide for shop fabricated assemblies including volume control dampers. Include electrical characteristics and connection requirements.
  - 2. Indicate for shop fabricated assemblies including volume control dampers.
- C. Closeout Documents:
  - 1. Project Record Drawings: Record actual locations of access doors and test holes.
  - 2. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    - a. See Section 01 6000 - Product Requirements for additional provisions.
    - b. Extra Fusible Links: One of each type and size. Additional links shall be turned over to the Owner at the end of the project.

**1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Protect dampers from damage to operating linkages and blades.

**PART 2 PRODUCTS**

**2.01 BACKDRAFT DAMPERS - METAL**

- A. Manufacturers:
  - 1. Nailor Industries, Inc: [www.nailor.com](http://www.nailor.com).
  - 2. Pottorff: [www.pottorff.com/#sle](http://www.pottorff.com/#sle).
  - 3. Ruskin Company, a brand of Johnson Controls: [www.ruskin.com](http://www.ruskin.com).
  - 4. Greenheck: [www.greenheck.com](http://www.greenheck.com)
  - 5. Loren Cook: [www.lorencook.com](http://www.lorencook.com)
  - 6. Substitutions: See Section 01 6000 - Product Requirements.

- B. Gravity Backdraft Dampers, Size 18 by 18 inches or Smaller, Furnished with Air Moving Equipment: Air moving equipment manufacturer's standard construction.
- C. Backdraft dampers shall be the counterbalanced type, with a screw type adjustment. Flanges shall be provided on either the intake or discharge side of the damper depending on installation needed in the curb.
- D. Damper blades shall consist of an extruded aluminum channel frame 0.063 in. thick, with 2 in. depth. The blades shall be 0.05 in. thick, extruded aluminum. Damper manufacturer's printed application and performance data including pressure, velocity and temperature limitations shall be submitted for approval. Damper shall be suitable for pressures to 2.5 in. wg, velocities to 2,000 ft./min and temperatures to 180 °F. Testing and ratings to be in accordance with AMCA Standard 500.
- E. The mechanical contractor shall work with the testing and balancing contractor to insure the dampers are adjusted during balancing to properly control building pressurization.
- F. Spring type dampers will not be allowed.
- G. Backdraft dampers shall have an air leakage rate not greater than 20 cfm/sq ft. where not less than 24 inches in either dimension and 40 cfm/sq ft. where less than 24 inches in either dimension. Leakage rate shall be at a pressure of 1.0" w.c.

## **2.02 DUCT ACCESS DOORS**

- A. Manufacturers:
  - 1. Nailor Industries, Inc: [www.nailor.com](http://www.nailor.com).
  - 2. Ruskin Company, a brand of Johnson Controls: [www.ruskin.com](http://www.ruskin.com).
  - 3. CESCO Advanced: [www.cescoproducts.com](http://www.cescoproducts.com)
  - 4. Kees: [www.kees.com](http://www.kees.com)
  - 5. National Controlled Air: [www.ncamfg.com](http://www.ncamfg.com)
  - 6. Vent Products: [www.ventproducts.com](http://www.ventproducts.com)
  - 7. Aire Technologies: [www.airetechnologies.com](http://www.airetechnologies.com)
  - 8. Substitutions: See Section 01 6000 - Product Requirements.
- B. Fabricate in accordance with SMACNA (DCS) and as indicated.
- C. Provide access doors with framed edges, equipped with latches in ductwork for inspection of all automatic operated dampers, etc.
- D. Access doors for round ducts shall be rectangular and shall be constructed in accordance with SMACNA HVAC Duct Construction Standards (latest edition). Access door dimensions shall not be less than 2" smaller than duct diameter. The door shall be provided with a handle and retaining ring. Access doors shall be equal to Ductmate, Model FD1 (rectangular door).
- E. Access doors for rectangular ducts shall be similar to Air Balance Model FSA 101 and constructed of 24 gauge galvanized steel with a 1" thick insulated door, frame and double cam latches. Frame shall be gasketed to minimize air leakage.
- F. Access doors for fire dampers, smoke dampers and fire/smoke dampers shall be a minimum of 12"x 12" in size. Increase duct size as required for access door installation.
- G. All duct access doors shall be accessible through walls, ceilings or floors. Provide access doors as required to reach duct access doors.
- H. Access doors with sheet metal screw fasteners are not acceptable.

## **2.03 DUCT TEST HOLES**

- A. Temporary Test Holes: Cut or drill in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.
- B. Permanent Test Holes: Factory fabricated, air tight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.

1. Manufacturers:
  - a. Carlisle HVAC Products; Dynair Test Port with Red Cap with O-Ring Seal: [www.carlislehvac.com/#sle](http://www.carlislehvac.com/#sle).
  - b. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.04 FIRE DAMPERS**

- A. Manufacturers:
  1. Nailor Industries, Inc: [www.nailor.com](http://www.nailor.com).
  2. Pottorff: [www.pottorff.com/#sle](http://www.pottorff.com/#sle).
  3. Ruskin Company, a brand of Johnson Controls: [www.ruskin.com](http://www.ruskin.com).
  4. Air Balance: [www.airbalance.com](http://www.airbalance.com)
  5. Greenheck: [www.greenheck.com](http://www.greenheck.com)
  6. Aire Technologies: [www.airetechnologies.com](http://www.airetechnologies.com)
  7. Substitutions: See Section 01 6000 - Product Requirements.
- B. Fabricate in accordance with NFPA 90A and UL 555, and as indicated. Dampers shall be 1-½ hour rated unless otherwise noted on the drawings as 3 hour rated. Installation of fire dampers shall be in accordance with latest edition of the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems.
- C. Horizontal or Vertical Dampers: Galvanized steel, 22 gage, 0.0299 inch frame, stainless steel closure spring, and lightweight, heat retardant non-asbestos fabric blanket.
- D. Curtain Type Dampers: Galvanized steel with interlocking blades. Provide stainless steel closure springs and latches for horizontal installations or vertical installations. Configure with blades out of air stream except for 1.0 inch pressure class ducts up to 12 inches in height.
- E. Dampers shall be furnished with galvanized steel sleeve that extends a minimum of six (6) inches on either side of the wall. Sleeve shall be furnished with metal thickness in accordance with UL 555.
- F. Multiple Blade Dampers: 16-gauge, 0.0598-inch galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, 1/8 by 1/2 inch plated steel concealed linkage, stainless steel closure spring, blade stops, and lock.
- G. Fire dampers shall be installed with access panel located in ductwork arranged to provide access to fusible link and blades for servicing.
- H. Fusible Links: UL 33, separate at 165 degrees F with adjustable link straps for combination fire/balancing dampers.

#### **2.05 VOLUME CONTROL DAMPERS**

- A. Manufacturers:
  1. Nailor Industries, Inc: [www.nailor.com](http://www.nailor.com).
  2. Pottorff: [www.pottorff.com/#sle](http://www.pottorff.com/#sle).
  3. Ruskin Company, a brand of Johnson Controls: [www.ruskin.com](http://www.ruskin.com).
  4. Aire Technologies: [www.airetechnologies.com](http://www.airetechnologies.com)
  5. Greenheck: [www.greenheck.com](http://www.greenheck.com)
  6. Substitutions: See Section 01 6000 - Product Requirements.
- B. Fabricate in accordance with SMACNA (DCS) and as indicated.
- C. Each register and diffuser air terminal shall be provided with a damper in the duct leading to the air terminal. Each branch duct leading to a group of two or more air terminals shall be provided with a damper at the point where the branch leaves the main duct. Dampers shall be installed with a maximum of 1/8" clearance all around. Dampers shall be installed so that they can be adjusted at any time after completion of the work, and shall be fitted with "Parker", or equal, damper quadrants. Quadrants shall be plainly marked to indicate position of damper. All dampers shall be tight fitting and be reinforced to prevent vibration. Damper handles shall be extended type for insulation clearance.

- D. Balancing dampers serving the inlet of a VAV box shall be installed in the size indicated for the high efficiency take off serving the VAV (not VAV inlet size). VAV inlet dampers shall be similar to Duro Dyne Corp. HDJD damper with continuous rod for 2" wg and over. Dampers shall be constructed of a minimum 22 gauge galvanized steel blades with high strength corrosion resistant 3/8" square rod extending 3 inches beyond the blade to accommodate exterior duct insulation. Dampers shall be provided with regulators similar to Duro Dyne ESO with a stand height of 1-1/2" to accommodate insulation thickness & designed for square shafts with locking wing nut to secure damper while balancing. Where damper shafts penetrate through the duct, a closed end bearing shall be installed on the end without the regulator and an open end bearing on the regulator end.
- E. Where damper shafts penetrate duct walls, the openings shall be properly sealed to eliminate air leakage.
- F. Each damper handle, where located above a lay-in tile ceiling, shall be identified by attaching section of flagging tape to the end of the damper handle. Length of flagging tape shall be approximately 12" long with longer or shorter lengths determined based on location of installation and clearance requirements. The flagging tape shall be high visibility, similar to pink or orange, to allow for ease of locating damper locations.
- G. Where dampers are located in ducts concealed above non-accessible ceiling, the dampers shall be equipped with Ventlock concealed, flush cap regulators.
- H. End Bearings: Except in round ducts 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon, thermoplastic elastomer, or sintered bronze bearings.
  - 1. Manufacturers:
    - a. Carlisle HVAC Products; Dynair End Bearing Leak Resistant Sets: [www.carlislehvac.com/#sle](http://www.carlislehvac.com/#sle).
    - b. Elgen Manufacturing Company, Inc; Snap-In Bushing: [www.elgenmfg.com/#sle](http://www.elgenmfg.com/#sle).
    - c. Substitutions: See Section 01 6000 - Product Requirements.
- I. Quadrants:
  - 1. Provide locking, indicating quadrant regulators on single and multi-blade dampers.
  - 2. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.
  - 3. Where rod lengths exceed 30 inches provide regulator at both ends.
  - 4. Manufacturers:
    - a. Carlisle HVAC Products; Dynair Double Shear Rattle Free Quadrants 1/2 inch: [www.carlislehvac.com/#sle](http://www.carlislehvac.com/#sle).
    - b. Substitutions: See Section 01 6000 - Product Requirements.

## 2.06 MISCELLANEOUS PRODUCTS

- A. Internal Strut End Plugs: Combination end-mounting and sealing plugs for metal conduit used as internal reinforcement struts for metal ducts; plug crimped inside conduit with outside gasketed washer seal.
  - 1. Manufacturers:
    - a. Carlisle HVAC Products; Dynair Internal Duct Reinforcement - Conduplugs: [www.carlislehvac.com/#sle](http://www.carlislehvac.com/#sle).
    - b. Substitutions: See Section 01 6000 - Product Requirements.
- B. Duct Opening Closure Film: Mold-resistant, self-adhesive film to keep debris out of ducts during construction.
  - 1. Thickness: 2 mils.
  - 2. High tack water based adhesive.
  - 3. UV stable light blue color.
  - 4. Elongation Before Break: 325 percent, minimum.

5. Manufacturers:
  - a. Carlisle HVAC Products; Dynair Duct Protection Film: [www.carlislehvac.com/#sle](http://www.carlislehvac.com/#sle).
  - b. Substitutions: See Section 01 6000 - Product Requirements.

### **PART 3 EXECUTION**

#### **3.01 INSTALLATION**

- A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA (DCS). See Section 23 3100 for duct construction and pressure class.
- B. Provide backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.
- C. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, combination fire and smoke dampers, before turning vanes on duct mains, and elsewhere as indicated. Provide minimum 12 by 12 inch size for hand access, size for shoulder access, and as indicated. Provide 4 by 4 inch for balancing dampers only. Review locations prior to fabrication.
- D. Provide duct test holes where indicated and required for testing and balancing purposes.
- E. Provide fire dampers at locations indicated, where ducts and outlets pass through fire rated components, and where required by Authorities Having Jurisdiction. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.
- F. Provide identification of access doors for Fire Dampers.
- G. Demonstrate re-setting of fire dampers to Owner's representative.
- H. At equipment supported by vibration isolators, provide flexible duct connections immediately adjacent to the equipment.
- I. Provide balancing dampers at points on supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Install minimum two duct widths from duct take-off.
- J. Use splitter dampers only where indicated.
- K. Provide balancing dampers on high velocity systems where indicated. See Section 23 3600.
- L. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.
- M. Provide balancing dampers on all takeoffs serving terminal devices.

**END OF SECTION**

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**SECTION 23 3423  
HVAC POWER VENTILATORS AND EXHAUST SYSTEMS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Ceiling exhaust fans.

**1.02 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Product Data: Provide data on fans and accessories, including fan curves with specified operating point plotted, power, rpm, sound power levels at rated capacity, and electrical characteristics and connection requirements.
- C. Closeout Documents:
  - 1. Manufacturer's Instructions: Indicate installation instructions.
  - 2. Maintenance Data: Include instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.
  - 3. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    - a. See Section 01 6000 - Product Requirements, for additional provisions.
    - b. Extra Fan Belts: One set for each individual fan.

**1.03 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS (UNLESS NOTED OTHERWISE BELOW)**

- A. Greenheck Fan Corporation: [www.greenheck.com](http://www.greenheck.com).
- B. Loren Cook Company: [www.lorencook.com](http://www.lorencook.com).
- C. Twin City Fan & Blower: [www.tcf.com/#sle](http://www.tcf.com/#sle).
- D. Substitutions: See Section 01 6000 - Product Requirements.

**2.02 CEILING EXHAUST FANS**

- A. Centrifugal Fan Unit: V-belt or direct driven with galvanized steel housing lined with acoustic insulation, resiliently mounted motor, gravity backdraft damper in discharge.
- B. Ceiling mounted exhaust fans shall be of the centrifugal direct drive type. The fan housing shall be constructed of steel. The access for wiring shall be external. The motor shall mounted on vibration isolators. The fan wheel shall be of the forward curved centrifugal type and dynamically balanced. All fans shall bear the AMCA Certified Ratings Seal for sound and air performance and shall be UL/cUL listed.
- C. Duct mounted exhaust, supply or return air fans shall be of the centrifugal direct drive type. The fan housing shall be constructed of steel. The steel duct collar shall accept round ductwork. The access for wiring shall be external. The motor shall mounted on vibration isolators. The fan wheel shall be of the forward curved centrifugal type and dynamically balanced. All fans shall bear the AMCA Certified Ratings Seal for sound and air performance and shall be UL/cUL Listed.
- D. Furnish with each fan a wall/roof cap termination per the manufacturer's instructions.
- E. Disconnect Switch: Cord and plug in housing for thermal overload protected motor.
- F. Grille: Molded white plastic.

- G. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheaves selected so required rpm is reached with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

### **PART 3 EXECUTION**

#### **3.01 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Provide gravity backdraft damper on outlet from cabinet and ceiling exhausters fans and as indicated.
- C. All mechanical equipment shall be lubricated. All equipment shall be operated for a period of sufficient duration to insure its proper mechanical operation.
- D. Any changing of pulley sizes if found necessary when testing systems, shall be done by this contractor. Any additional dampers which may be found necessary to get proper air supply and quantity shall be furnished by this contractor at no expense to the Owner.

**END OF SECTION**

**SECTION 23 3600  
AIR TERMINAL UNITS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Single-duct terminal units.

**1.02 REFERENCE STANDARDS**

- A. AHRI 410 - Forced-Circulation Air-Cooling and Air-Heating Coils; 2001, with Addenda (2011).
- B. AHRI 880 (I-P) - Performance Rating of Air Terminals; 2017 (Reaffirmed 2023).
- C. ASHRAE Std 130 - Laboratory Methods of Testing Air Terminal Units; 2025.
- D. ASTM A492 - Standard Specification for Stainless Steel Rope Wire; 1995 (Reapproved 2019).
- E. ASTM A603 - Standard Specification for Metallic-Coated Steel Structural Wire Rope; 2019.
- F. ASTM C1071 - Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material); 2025.
- G. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2021.
- H. SMACNA (SRM) - Seismic Restraint Manual Guidelines for Mechanical Systems; 2024.
- I. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors; Current Edition, Including All Revisions.

**1.03 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Product Data: Provide data indicating configuration, general assembly, and materials used in fabrication. Include catalog performance ratings that indicate airflow, static pressure, and NC designation. Include electrical characteristics and connection requirements.
  - 2. Indicate configuration, general assembly, and materials used in fabrication, and electrical characteristics and connection requirements.
    - a. Include schedules listing discharge and radiated sound power level for each of the second through sixth-octave bands at inlet static pressures of 1 to 4 in-wc.
  - 3. Certificates: Certify that coils are tested and rated in accordance with AHRI 410.
- C. Closeout Documents:
  - 1. Manufacturer's Installation Instructions: Indicate support and hanging details, installation instructions, recommendations, and service clearances required.
  - 2. Project Record Documents: Record actual locations of units and locations of access doors required for access of valving.
  - 3. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts lists. Include directions for resetting constant-volume regulators.
  - 4. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
  - 5. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    - a. See Section 01 6000 - Product Requirements for additional provisions.

**1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

- B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

#### **1.05 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Provide 18-month manufacturer warranty for air terminal units.

### **PART 2 PRODUCTS**

#### **2.01 SINGLE-DUCT, VARIABLE-VOLUME AND CONSTANT-VOLUME UNITS**

- A. Manufacturers:
  - 1. Trane, a brand of Ingersoll Rand: [www.trane.com](http://www.trane.com).
  - 2. Substitutions: See Section 01 6000 - Product Requirements.
- B. General:
  - 1. Factory-assembled, AHRI 880 (I-P) rated and bearing the AHRI seal, air volume control terminal with damper assembly, flow sensor, externally mounted volume controller, duct collars, and all required features.
  - 2. Control box bearing identification, including but not necessarily limited to nominal cfm, maximum and minimum factory-set airflow limits, coil type and coil (right or left hand) connection, where applicable.
  - 3. Units shall deliver the maximum scheduled cfm with an air pressure drop not to exceed 0.35", including all accessories listed below.
- C. Unit Casing:
  - 1. Minimum 22 gauge, 0.0299 inch galvanized steel.
  - 2. Air Inlet Collar: Provide round, suitable for standard duct sizes.
  - 3. Unit Discharge: Rectangular, with slip-and-drive connections.
  - 4. Provide control cabinet enclosure mounted to VAV box. Control Cabinet access door shall match construction of VAV box.
  - 5. Acceptable Liners:
    - a. 1/2 inch thick, coated, fibrous-glass complying with ASTM C1071. All terminal coil casings shall be constructed and insulated to the same standard as the VAV box.
      - 1) Secure with adhesive.
      - 2) Coat edges exposed to airstream with NFPA 90A approved sealant.
      - 3) Cover liner with non-porous foil.
    - b. Liner not to contain pentabrominated diphenyl ether (CAS #32534-81-9) or octabrominated diphenyl ether.
- D. Damper Assembly:
  - 1. Heavy-gauge, galvanized steel, or extruded aluminum construction with solid steel, nickel-plated shaft pivoting on HDPE, self-lubricating bearings.
  - 2. Provide integral position indicator or alternative method for indicating damper position over full range of 90 degrees.
  - 3. Incorporate low leak damper blades for tight airflow shutoff.
    - a. Air Leakage Past Closed Damper: Maximum two percent of unit maximum airflow at 3 in-wc inlet static pressure, tested in accordance with ASHRAE Std 130.
- E. Controls:
  - 1. DDC (Direct-Digital Controls):
    - a. See Section 23 0923. Controls for VAV box shall be furnished by the temperature controls contractor for field mounting,
  - 2. Airflow Sensor: Differential pressure airflow device measuring total, static, and wake pressures.
    - a. Signal accuracy: Plus/minus five percent throughout terminal operating range.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that conditions are suitable for installation.
- B. Verify that field measurements are as indicated on drawings.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install the inlets of air terminal units and air flow sensors a minimum of four duct diameters from elbows, transitions, and duct takeoffs.
- C. See drawings for the size(s) and duct location(s) of the air terminal units.
- D. Provide ceiling access doors or locate units above easily removable ceiling components.
- E. Support units individually from structure with wire rope complying with ASTM A492 and ASTM A603 in accordance with SMACNA (SRM). See Section 23 0548.
- F. Do not support from ductwork.
- G. Connect to ductwork in accordance with Section 23 3100.

### **3.03 ADJUSTING**

- A. Reset volume with damper operator attached to assembly allowing flow range modulation from 100 percent of design flow to zero percent full flow.

### **3.04 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - Quality Requirements for additional requirements.

### **3.05 CLEANING**

- A. Vacuum clean coils and inside of units.
- B. Install new filters.

### **3.06 CLOSEOUT ACTIVITIES**

- A. See Section 01 7800 - Closeout Submittals for closeout submittals.
- B. See Section 01 7900 - Demonstration and Training for additional requirements.

**END OF SECTION**

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**SECTION 23 3700  
AIR OUTLETS AND INLETS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Diffusers:
- B. Registers/grilles:

**1.02 REFERENCE STANDARDS**

- A. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating; 2023.
- B. ASHRAE Std 70 - Method of Testing the Performance of Air Outlets and Air Inlets; 2023.

**1.03 SUBMITTALS**

- A. See Division 01 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
- C. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

**1.04 QUALITY ASSURANCE**

- A. Test and rate air outlet and inlet performance in accordance with ASHRAE Std 70.
- B. Test and rate louver performance in accordance with AMCA 500-L.
- C. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Krueger-HVAC, Division of Air System Components: [www.krueger-hvac.com](http://www.krueger-hvac.com).
- B. Price Industries: [www.price-hvac.com/#sle](http://www.price-hvac.com/#sle).
- C. Titus, a brand of Air Distribution Technologies: [www.titus-hvac.com](http://www.titus-hvac.com).
- D. Tuttle and Bailey: [www.tuttleandbailey.com/#sle](http://www.tuttleandbailey.com/#sle).
- E. Nailor: [www.nailor.com](http://www.nailor.com)
- F. Substitutions: See Section 01 6000 - Product Requirements.

**2.02 REFER TO DRAWINGS AND SCHEDULES FOR REQUIRED DIFFUSERS, GRILLES, AND REGISTERS.**

**PART 3 EXECUTION**

**3.01 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Check location of outlets and inlets and make necessary adjustments in position to comply with architectural features, symmetry, and lighting arrangement.
- C. Install diffusers to ductwork with air tight connection.
- D. Paint ductwork visible behind air outlets and inlets matte black, see Section 09 9123.

**END OF SECTION**



**SECTION 26 0003  
ELECTRICAL GENERAL REQUIREMENTS**

**ELECTRICAL GENERAL REQUIREMENTS**

**PART 1 GENERAL**

**2.01 SECTION INCLUDES**

- A. Requirements and Standards specifically applicable to the following work required to complete the project:
  - 1. Electrical Systems Work.
  - 2. Communications Systems Work.
  - 3. Electronic Safety and Security Systems Work.
- B. This section describes the functional performance criteria that the completed Work shall include/provide.

**2.02 RELATED SECTIONS**

- A. Drawings, addenda and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification Sections, apply to this section.
- B. This section is directly related to all other specifications of the project manual including Division 01 - General Requirements.
- C. See project manual for description of Alternate Bids and related Work.

**2.03 SCOPE OF WORK**

- A. Work includes providing all labor, and materials necessary for satisfactory completion of all work shown on or required by all Drawings and in all specifications. In general, this consists of the following:
  - 1. Providing all demolition of existing equipment required to perform the work shown on or required by all Drawings.
  - 2. Low Voltage Power Distribution.
  - 3. Wiring devices.
  - 4. Communications Systems.
  - 5. Electronic Safety and Security Systems.
  - 6. Other systems specified, indicated, or shown.
- B. Contractor shall visit site, prior to submitting his bid, to familiarize himself with all existing systems and conditions. This includes measurements for lengths, quantities, clearances and all other field verifiable conditions. No extra charges will be allowed because of failure of Contractor to become familiar with all existing conditions.

**2.04 GENERAL REQUIREMENTS**

- A. All specifications, corresponding Drawings and all addenda form a complete set of documents for Work for this project, and no part shall be considered complete without the other.
- B. Contractor shall obtain all required licenses, permits, plan reviews, inspections and pay all fees, costs and all other charges for this project.
- C. All sales, use and any other taxes shall be paid by Contractor.
- D. Contractor shall comply with all ordinances, laws, regulations and codes applicable to the work involved including ANSI/NFPA 70, Latest Edition. If, in any instance, the plans and specifications conflict with such laws, the law shall take preference. This does not relieve the contractor from complying with any requirements of the drawings and specifications that may be in excess of the rules and not contrary to same.
- E. If Contractor is aware of conflicts between drawings or specifications and such codes or regulations, they shall be brought to the Architect or Engineer's attention prior to commencing

work. If Contractor performs work in violation of such codes or regulations, whether such violation is shown or specified or not, Contractor shall correct the violation at his expense.

- F. Any work not clear to Contractor shall be referred to Architect or Engineer for clarification before bid is submitted. If no question is raised prior to opening of bid, Contractor shall be required to provide work, in question, as directed by Architect or Engineer, whose decision shall be final, without additional charges.
- G. By virtue of submitting a bid, Contractor agrees that he is skilled and experienced in use of and in interpretation of drawings and specifications. Contractor further agrees that he has carefully reviewed all drawings, all specifications and all addenda, which constitute bid documents for this contract, and finds them free of ambiguities and good and sufficient for bidding and construction purposes.

## **2.05 REGULATORY REQUIREMENTS**

- A. A partial list of governing codes (latest edition) in addition to ANSI/NFPA 70 are:
  - 1. State and Local Electric Codes.
  - 2. International Building Code (IBC).
  - 3. State Building Code.
  - 4. International Fire Code. (IBC).
  - 5. State Fire Codes.
  - 6. State Health Department Requirements.
  - 7. Serving Utility Regulations.
  - 8. National Fire Protection Association (NFPA) National Fire Codes.
    - a. NFPA 70 - National Electrical Code.
    - b. NFPA 72 - National Fire Alarm and Signaling Code.
    - c. NFPA 99 - Healthcare Facilities Code
    - d. NFPA 101 - Life Safety Code.
  - 9. Williams-Steiger (OSHA) Regulations.
  - 10. Americans with Disabilities Act (ADA) requirements.
  - 11. Facilities Guideline Institute (FGI).

## **2.06 INSTALLATION REQUIREMENTS AND STANDARDS**

- A. Description of Conductor Installation Requirements
  - 1. Conductor and conduit sizes noted on Drawings are based on type THHN copper unless noted otherwise.
  - 2. Branch Circuits: Copper. Solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.
    - a. Use stranded conductors for control circuits.
    - b. Use conductor not smaller than 12 AWG for power and lighting circuits.
    - c. Use conductor not smaller than 16 AWG for control circuits.
    - d. Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 60 feet.
    - e. Use 10 AWG conductors for 20 ampere, 277 volt branch circuits longer than 145 feet.
- B. Wiring Methods
  - 1. Motor Feeders: Type THHN-THWN or XHHW-2 single conductors in raceway.
  - 2. Branch Circuits:
    - a. Multi-wire branch circuits shall not be acceptable. Provide dedicated neutral conductor for each circuit.
    - b. Home Runs (from circuit breaker to junction box at accessible location adjacent to first wiring device): Type THHN-THWN single conductors in raceway.
    - c. Exposed (including in crawl spaces, electrical rooms, mechanical rooms, and above accessible ceilings): Type THHN-THWN single conductors in raceway.
    - d. Concealed (e.g. in ceilings, walls, partitions): Type THHN-THWN single conductors in raceway.

- e. Concealed (e.g. in ceilings, walls, partitions): Type THHN-THWN single conductors in raceway or multi-conductor cable Type MC.
  - 1) MC cable is generally permitted to installed concealed within walls or above non-accessible ceilings only. Limit exposed runs of MC cable above accessible ceilings to 8' and install parallel or perpendicular to building lines.
  - 2) All homeruns to be single conductors in raceway, and each homerun shall have a junction box installed above the accessible ceiling.
  - 3) Type MC cable shall not be installed where it is subject to physical damage.
  - 4) Class 1 Control Circuits: Type THHN-THWN single conductors in raceway.
- 3. Class 2 Control Circuits:
  - a. For lighting control devices (occupancy sensors, low-voltage switches, etc.), exposed multi-conductor cable, plenum rated shall be acceptable in concealed locations. Install cabling in accordance with section 27 0528.
  - b. Unless otherwise noted all other locations use type THHN-THWN single conductors in raceway.
- C. Description of Power Raceway Installation Requirements
  - 1. Conduit sizes noted on Drawings are based on type THHN copper unless noted otherwise.
  - 2. Conduit at interior locations:
    - a. Concealed within stud walls: Use EMT, or flexible steel conduit (FMC). Limit lengths of FMC concealed within walls to 6' or less.
    - b. Concealed above accessible ceilings: Use EMT.
      - 1) For connections to devices mounted within the accessible ceiling system or mounted to the ceiling tiles: use FMC in lengths no greater than 6' unless noted otherwise.
      - 2) Concealed above non-accessible ceilings: Use EMT.
      - 3) Exposed locations not subject to physical damage: Use IMC, RAC, RMC, EMT, and surface metal raceways (where approved or indicated).
      - 4) Exposed locations subject to physical damage use IMC or RMC.
      - 5) Subject to physical damage: Use IMC or RMC.
  - 3. Electric nonmetallic tubing (ENT) and flexible nonmetallic conduit are not acceptable except where specifically noted on drawings or other sections of the specification.
- D. The following industry standards shall apply as minimum requirements.
  - 1. NEMA and ANSI Standards.
  - 2. BICSI standards.
  - 3. EIA / TIA Standards.
  - 4. Underwriters Laboratories Standards (UL).
  - 5. National Electrical Contractors Association (NECA) Standards. The following is a partial list of applicable NECA Standards:
    - a. NECA 1 - Standard for Good Workmanship in Electrical Construction.
    - b. NECA 101 - Standard for Installing Steel Conduit (Rigid, IMC, EMT).
    - c. NECA 407- Recommended Practice for Installing and Maintaining Panelboards.
    - d. NECA 500 - Standard for Installing Indoor Commercial Lighting Systems.
    - e. NECA/BICSI 568 - Standard for Installing Building Telecommunications Cabling.

## 2.07 SUBSTITUTIONS

- A. Where substitute materials or prior approved materials are provided, Contractor shall assume all responsibility and pay for all necessary changes resulting from such substitution. This responsibility shall also include any extra costs required by other trades.
- B. Prior approved substitutions:

1. Required where specifically noted or where materials are specifically identified by a manufacturer's name, model or catalog number. In these cases only such material may be included in base bid.
  2. If Contractor desires to furnish materials other than that named, Contractor or supplier shall apply in writing, to Engineer, for prior approval of such material at least ten (10) days prior to bid opening date.
  3. Requests for prior approved substitution shall indicate specific proposed materials in lieu of those specified together with complete technical data for all such proposed material.
  4. All prior approved substitutions will be clearly identified in addenda which will be sent to all bidders well in advance of bid opening. Only material listed on drawings, specifications and addenda shall be provided.
- C. Substitutions after execution of contract: Substitution of materials other than those specifically named in contract documents will be approved, by Engineer, for following reason only:
1. That material proposed for substitution is equal to or superior, in Engineer's opinion, to that specified in construction, efficiency, appearance, and utility.
  2. That material named in the documents cannot be delivered to project in time to complete work due to conditions beyond control of Contractor.
- D. Equal To and Or Equal: Where materials are specifically identified as "equal to" an identified manufacturer's name, model, or catalogue numbers or where noted as "or equal" manufacturer's complying with the requirements of these specifications not listed may be incorporated in the Work. Such materials must be equal to or superior, in Engineer's opinion, to that specified in construction, efficiency, appearance, and utility.

## **2.08 COORDINATION**

- A. Sequence and coordinate work with other trades so as to avoid conflict of space and time sequence. Installation of materials shall be coordinated with other trades and installed at such time and manner as to not delay or interfere with the work of other trades. If interference develops, the matter shall be brought to the attention of the Architect for decision. Organize the work so that progress of work will conform to the progress of other trades. Complete the entire installation as soon as building conditions permit.
- B. This Contractor shall be held solely responsible for coordinating proper size and location of hangers, slots, chases, openings, etc., required for proper installation of his work and shall arrange with the proper building contractors for inserts, chases, and openings.
- C. Refer to drawings and specifications of all other divisions and trades for correlating information, location and details of work, dimensions, etc. Coordinate location of all outlets and equipment. If conflicts develop Architect's decision will govern. No additional compensation will be allowed for moving of un-coordinated, misplaced or poorly located outlets, material, equipment or work
- D. Personally, or through an authorized and competent representative, constantly supervise work from beginning through completion and final acceptance. So far as possible contractor shall keep same foreman and workmen throughout project duration. Keep enough workmen on job to insure keeping up with or ahead of other trades so that no delays occur.
- E. During its progress, the work shall be subject to observation by representatives of Owner, and Architect at which times Contractor shall furnish all required information and cooperation

## **2.09 SUBMITTALS FOR REVIEW**

- A. Provide Submittals for Review for the following equipment, components, and / or systems:
  1. Luminaires.
  2. Lighting Controls (include manufacturer's design services for a lighting controls layout based on performance description on the drawings)
  3. Disconnects.
  4. Communications Horizontal Cabling.

5. Fire Alarm System.
- B. Within 30 days after award of Contract the Contractor shall submit for acceptance minimum of six (6) copies for the equipment or systems requested.
- C. Submittals shall be grouped to include complete submittals of related systems, products, and accessories in a single submittal.
- D. Submittal shall include:
  1. At the front of the submittal on dedicated page(s): Any deviation from contract requirements shall be called to attention. No deviation will be permitted without written approval of Architect or Engineer.
  2. At the front of the submittal on dedicated page(s): Any requests for clarification, selections that must be made, etc. shall be called to attention.
  3. Drawings and brochures shall be clearly marked as to item to be supplied and shall have designation corresponding to designation on Drawings (for example: enclosed switch data shall indicate for which equipment they are provided).
  4. Manufacturer's name and address.
  5. Catalog designation or model number.
  6. Manufacturer's product data for each component (e.g. submittal of luminaires shall include both lamp and ballast information).
  7. Catalog sheets showing ratings, settings, performance curves and rated capacities.
  8. Dimensions, knockout sizes and locations, materials, fabrication details, finishes.
  9. Outline and support point dimensions, voltage, ampacity, integrated short circuit ampere rating, arrangement and sizes, and accessories
- E. Engineer will review the submitted drawings with reasonable promptness, and return same to Contractor. No equipment should be released for shipment until drawings and brochures have been approved by Engineer.
- F. Review of shop drawings and brochures shall not permit departures from contract documents or relieve Contractor of responsibility for error in detail, dimension, quantity or otherwise that may exist, or as approving departures from additional details or instructions previously furnished.

## **2.10 SUBMITTALS FOR CLOSEOUT**

- A. As Built Drawings:
  1. The contractor shall maintain one set of drawings at the job site to be used as a master copy. All changes and deviations shall be clearly marked and noted by colored pencil. These drawings shall be turned over to the Engineer upon project completion.
  2. Indicate specific locations and sizes of all equipment, conduit and cabling installed as part of Work.
  3. Provide all Certificates of Compliance indicating appropriate installation of all materials by authority having jurisdiction as described herein under separate tab in Operation and Maintenance Manuals labeled "Certificates of Compliance".
- B. Operations and Maintenance Manual:
  1. Bind operations and maintenance manual for electrical system in a hard-back binder. Front cover of each binder shall include title of manual, project name, project location, and date of completion. Provide a duplicate electronic copy of the manual in pdf format with searchable text, grouped and bookmarked per the below description.
  2. Provide a master index at the beginning of manual indicating items included.
  3. First section shall consist of name, address, and phone number of Architect, Electrical Engineer, Contractor, and all associated Subcontractors. Also include a complete list of equipment used with name, address, and phone number of vendor.

4. Provide a section for the following information with tabs, dividers, or other means of separating each different component within the system as well as separating each item or system from the next:
  - a. Luminaires (including lamp and ballast information).
  - b. Lighting Controls.
  - c. Communications Systems (e.g. equipment room fittings, cabling, accessories).
  - d. Fire alarm and detection system.
  - e. Certificates of Compliance.
  - f. Testing Reports. Include testing reports indicating results of tests and other information required by these specifications.
  - g. Summary list of equipment requiring lubrication indicating name of equipment, location and type and frequency of lubrication
5. Turn over to owner all supplied manufacturer's warranty documentation under a separate tab in the Operation and Maintenance Manuals labeled "Warranties".
6. Turn over to owner and obtain signed receipt for all maintenance materials, spare parts, touched up parts and loose items.

### **2.11 PROJECT SUBCONTRACTOR AND VALUES LISTING**

- A. Within five (5) days after contract execution date Contractor shall submit, to Architect, a list indicating brands of all major materials, names of all of his subcontractors and a schedule of values for this project. Architect reserves right to reject any material or subcontractor and question scheduled values.

## **PART 2 PRODUCTS**

### **3.01 GENERAL MATERIAL REQUIREMENTS**

- A. Materials shall be standard products of manufacturer's regularly engaged in the production of such equipment and shall be the manufacturer's latest standard design.
- B. When two or more items of same material or equipment are required they shall be of the same manufacturer.
- C. Materials and Finishes: Provide adequate corrosion resistance to eliminate staining of exposed surfaces.

### **3.02 CONDUCTORS AND CABLES**

- A. Manufacturers:
  1. AFC Cable Systems Inc. (Multiconductor cable)
  2. Alfex Corp. (Southwire)
  3. American Insulated Wire Corp.
  4. American Wire Group
  5. Cerrowire
  6. Coleman Cable, Inc.
  7. Encore Wire, Ltd.
  8. Essex Cable Company
  9. Service Wire Co.
  10. Substitutions under provision of Division 01 and Section - Electrical General Requirements.
- B. Copper conductors (THHN/THWN):
  1. Comply with NEMA WC 70, NFPA 70, and UL 83 or UL 44, UL 1063, UL 1581.
  2. Type THHN cable shall meet all applicable ASTM standards
  3. Type THHN cable shall meet Federal Specification A-A-59544.
  4. UL listed sunlight resistant in black sizes 2AWG and larger. Sizes 1/0 and larger listed for CT USE. Sizes 14 through 1 AWG shall be rated VW-1. Sizes 8 AWG and larger shall be rated THWN-2.

5. Sizes 14 AWG and 12 AWG shall be solid and 10 AWG may be either solid or stranded, 8 AWG and larger are stranded.
6. Conductor shall be soft annealed copper.
7. Insulation shall be high-heat and moisture resistant PVC.
8. Jacket shall be abrasion, moisture, gasoline and oil resistant or listed equivalent.
9. Self-lubricating Jacket: Jackets on conductors sizes 2 and larger shall be Southwire "SIMpull" or equivalent with integrated self-lubrication.

C. Type MC Cable:

1. Comply with the following:
  - a. UL 1569 Standard for Metal-Clad Cables (specifically provisions of Section 6.1.5A).
  - b. UL Standard 83 for Thermoplastic-Insulated Wires and Cables or UL Standard 44 for Thermoset-Insulated Wires and Cables.
  - c. UL Standard 1479 Standard for Fire Tests of Through-Penetration Firestops.
  - d. UL Classified 1, 2, and 3 Hour Through-Penetration Firestop Systems.
  - e. MC Cable installed in cable tray shall comply with Article 392 of the National Electrical Code.
2. Cable Construction:
  - a. Conductors shall be color coded for 120/208 and 277/480 volt systems.
  - b. For Circuits: Conductors are made from class B copper. Sizes 14 AWG and 12 AWG shall be solid and 10 AWG may be either solid or stranded, 8 AWG and larger are stranded. Ground conductor shall be copper. Grounding Conductor shall have green insulation and be cabled with the phase conductors. Where noted or indicated on Drawings provide an additional grounding conductor for isolated or redundant grounding. Cable shall have a neutral conductor per phase.
  - c. Insulation: THHN/THWN or XHHW-2, rated for 90oC dry or wet at 600 volts max.
  - d. Ground Conductor:
  - e. For circuit applications size of grounding conductor shall be based on the rating of the over-current device.
  - f. Armor: Interlocked aluminum, helically formed around the conductor assembly.

### 3.03 CONNECTORS AND SPLICES

A. Manufacturers:

1. AFC Cable Systems Inc.
2. AMP
3. 3M
4. Burndy
5. Ideal Industrial Inc.
6. IIsco
7. Kearney
8. Panduit
9. Tyco Electronics Corp.
10. Substitutions under provision of Division 01 and Section - Electrical General Requirements.

B. Factory fabricated connectors and splices of size, ampacity rating, material type, and class for application and service indicated.

C. Connections for Conductors:

1. Mechanical Screw Type Connectors:
  - a. Connectors shall be dual rated (AL7CU or AL9CU) and Listed by UL for use with aluminum and copper conductors and sized to accept aluminum conductors of the ampacity specified. Connectors shall be Burndy Unitap, IIsco NIMBUS4FLEX, or approved equal.
2. Mechanical Compression Type Connectors:

- a. Connectors shall be dual rated (AL7CU or AL9CU) and Listed by UL for use with aluminum and copper conductors and sized to accept aluminum conductors of the ampacity specified.
  - b. The lugs shall be marked with wire size, die index, number and location of crimps and shall be suitably color-coded. Lug barrel shall be factory prefilled with a joint compound Listed by UL.
3. Termination of Conductor to Aluminum Bus:
- a. Hardware:
    - 1) Bolts: Anodized alloy 2024-T4 and conforming to ANSI B18.2.1 and to ASTM B211 or B221 chemical and mechanical property limits.
    - 2) Nuts: Aluminum alloy 6061-T6 or 6262-T9 and conforming to ANSI B18.2.2.
    - 3) Washers: Flat aluminum alloy 2024-T4, Type A plain, standard wide series conforming to ANSI B27.2.
4. Termination of Conductor to Copper Bus:
- a. Hardware:
    - 1) Bolts: Plated or galvanized medium carbon steel; heat treated, quenched and tempered equal to ASTM A-325 or SAE grade 5.
    - 2) Nuts: Heavy semi-finished hexagon, conforming to ANSI B18.2.2, threads to be unified coarse series (UNC), class 2B.
    - 3) Washers: Should be steel, Type A plain standard wide series conforming to ANSI B27.2.
    - 4) Belleville conical spring washers: Shall be of hardened steel, cadmium plated or silicone bronze.

### 3.04 CONDUIT AND TUBING

- A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include but not limited to those listed herein.
- B. Minimum Size for all conduit materials shall be 1/2 inch unless otherwise required, indicated or specified. Minimum home run size for branch circuits shall be 3/4 inch.
- C. Flexible Metal Conduit (FMC):
  - 1. Manufacturers:
    - a. AFC Cable Systems, Inc.
    - b. Electriflex Co.
    - c. Or equal.
  - 2. Description: NFPA 70, type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1.
    - a. Interlocked steel construction.
    - b. If used as part of fire stop system FMC must be listed for applicable installation.
  - 3. Metallic Fittings and Conduit Bodies:
    - a. Manufacturers:
      - 1) Bridgeport Fittings Inc.
      - 2) O-Z/Gedney
      - 3) Thomas & Betts Corporation.
      - 4) Manufactured in accordance with ANSI/NEMA FB 1; listed and labeled as complying with UL 514B.
      - 5) Material: Steel. Do not use cast zinc fittings.
- D. Liquidtight Flexible Metal Conduit (LFMC):
  - 1. Manufacturers:
    - a. AFC Cable Systems, Inc.
    - b. Electriflex Co.
    - c. Or equal.

2. Description: NFPA 70, LFMC PVC jacketed steel FMC listed and labeled as complying with UL 360.
    - a. Interlocked steel construction with PVC jacket.
  3. Metallic Fittings and Conduit Bodies:
    - a. Manufacturers:
      - 1) Bridgeport Fittings Inc.
      - 2) O-Z/Gedney
      - 3) Thomas & Betts Corporation.
      - 4) Comply with ANSI/NEMA FB 1; listed and labeled as complying with UL 514B.
      - 5) Material: Steel. Do not use cast zinc fittings.
      - 6) Rain tight compression ring with Insulated throat.
- E. Electrical Metallic Tubing (EMT):
1. Manufacturers:
    - a. Allied Tube and Conduit
    - b. Republic Conduit.
    - c. Wheatland Tube Co.
    - d. Or equal.
  2. Description: NFPA 70, type EMT steel electrical metallic tubing manufactured in accordance with ANSI C80.3 listed; labeled as complying with UL 797.
  3. Metallic Fittings and Conduit Bodies:
    - a. Manufacturers:
      - 1) Bridgeport Fittings Inc.
      - 2) O-Z/Gedney
      - 3) Thomas & Betts Corporation.
      - 4) Manufactured in accordance with ANSI/NEMA FB 1; listed and labeled as complying with UL 514B.
      - 5) Material: Steel. Do not use cast zinc fittings.
      - 6) Use set-screw or compression connectors and couplings. Do not use indenter type.
      - 7) Where permitted for use in wet or damp locations use fittings listed for use in wet locations.
      - 8) Embedded with Concrete: use "concrete tight" listed fittings.

### 3.05 OUTLET BOXES

- A. Manufacturers
  1. Appelton Electric.
  2. Crouse-Hinds.
  3. O-Z/Gedney.
  4. Square D. Co.
  5. Steel City.
  6. Thomas & Betts.
  7. Wiremold Co.
  8. Raco Co.
- B. Sheet Metal Outlet Boxes: manufactured in accordance with NEMA OS 1; listed and labeled as complying with UL 514A.
- C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy or aluminum, Type FD, with gasketed cover.
- D. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight; include ½ inch male fixture studs where required.

- E. Gangable boxes are prohibited, unless specifically noted otherwise.
- F. Nonmetallic Outlet Boxes: are not acceptable.
- G. Cast Boxes: NEMA FB 1, Type FD, and FS..

### **3.06 WIRING DEVICES**

- A. Except as noted, all wiring devices shall be heavy duty type, exposed color shall match existing adjacent devices or be selected by Engineer or Architect unless indicated otherwise.
- B. Manufactured by: Bryant, Cooper Wiring Devices, Eagle Electric Mfg. Co., Inc., Hubbell Inc, Leviton, or Pass and Seymour.
- C. Snap switches shall be 120/277 volt, 20-Ampere.
- D. Receptacles shall be NEMA 5-20R, 125 volt, 20-Ampere.
- E. Provide GFCI receptacles where indicated.
- F. All receptacles shall be listed tamper resistant type.
- G. Wall Plates:
  - 1. Unbreakable reinforced (stiffened) plastic with smooth face and rounded edges with steel screws of matching color.
  - 2. Color shall match device color.

### **3.07 NAMEPLATES AND SELF ADHESIVE LABELS**

- A. Self Adhesive Labels: Pressure sensitive adhesive back, rated for harsh environment.
  - 1. 1/2" clear label with black standard block type text.
  - 2. 1/4" clear label with 1/8" black standard block type text.

### **3.08 ENCLOSED SWITCHES**

- A. Approved manufacturers: Siemens, Square D, Cutler Hammer, A.
- B. General: NEMA KS 1, UL 98, 600V ac, horsepower rated. Where indicated provide with clips to accommodate fuses specified. Heavy duty type load interrupter knife switch with externally operable handle interlocked with the cover to prevent opening with switch closed. Handle lockable in the off position. Enclosure complying with NEMA 250 suitable for environment installed.

### **3.09 LUMINAIRES**

- A. Provide luminaires as scheduled on Drawings.
- B. See light fixture schedule/specification on drawings.
- C. Warranty:
  - 1. Warranty for LED Drivers: 5 years from date of manufacture against defects in material or workmanship, for operation at a maximum case temperature of 70C.
  - 2. Warranty for LED fixtures / modules: 5 years from the date of manufacture.
- D. Maintenance Service
  - 1. Replace or repair any luminaires that have failed or malfunctioned at Substantial Completion and for a period of one year after substantial completion.
- E. Provide factory installed disconnect device on all fixtures.
- F. Where painted finishes are indicated or required for luminaires and lighting fixtures; paint shall be applied to parts after fabrication and prior to assembly. Painting process shall include coverage of all surfaces including edges and corners. In general, prepainted metals are not acceptable for lighting fixture assemblies, parts or units.
- G. Provide factory installed disconnect device on all fixtures.
- H. Where painted finishes are indicated or required for luminaires and lighting fixtures; paint shall be applied to parts after fabrication and prior to assembly. Painting process shall include

coverage of all surfaces including edges and corners. In general, prepainted metals are not acceptable for lighting fixture assemblies, parts or units.

- I. LED Luminaires
  - 1. Photometric measurements indicated on product data shall be provided in accordance with IESNA LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products and shall meet the requirements specified and / or indicated on the Drawings.
  - 2. Lumen data indicated on product data sheets shall be generated in accordance with IESNA LM-80-08 IES Approved Method for Measuring Lumen Maintenance of LED Light Sources and shall meet the requirements specified and / or indicated on the Drawings.
  - 3. Lumen depreciation shall be identified in terms of IES TM-21-11. Unless noted otherwise, luminaires shall provide a minimum L70 rating at the drive current provided product data shall indicate such.
  - 4. Correlated color temperature (CCT) indicated on the product data sheets shall be provided in accordance with ANSI C78.377-2008 American National Standard for Electric Lamps—Specifications for the Chromaticity of Solid State Lighting (SSL) Products and shall meet the requirements specified and / or indicated on the Drawings. Acceptable variation in color temperatures specified shall be +/- 275K.
  - 5. Lumen output specified shall be lumens delivered from the luminaire at the color temperature specified.
  - 6. Luminaires efficacy shall meet that specified / scheduled at the CCT specified.
- J. LED Drivers
  - 1. Drivers shall be universal voltage (120-277 volt) or shall be 208 volt, or 480 volt as required to meet project conditions.
  - 2. Drivers shall be provided with protection against a transient line surge as noted on the Drawings.
  - 3. Drivers shall be equipped with quick disconnect.
  - 4. Power factor > 0.9.
  - 5. Harmonic distortion < 20%.
  - 6. Ambient temperature range: 104 degrees F to -30 degrees F.
  - 7. UL listed.

### **3.10 LIGHTING CONTROL DEVICES**

- A. See drawings for information on lighting controls requirements.
- B. Provide products from following manufacturers:
  - 1. WattStopper
  - 2. NLight
  - 3. Sensor Switch
  - 4. Lutron
  - 5. Hubbell
  - 6. Steinel
- C. Submittal Requirements: In addition to product data, the manufacturer shall submit plans showing locations for sensors and control devices based on the design intent described on the drawings. The layout shall be produced and designed by the manufacturer's representative based on device specification to ensure proper coverage and performance.

### **3.11 PATHWAYS FOR STRUCTURED CABLING SYSTEMS**

- A. Non-continuous cable support system products manufactured by Erico CableCat (J-hook type), Panduit Tak-Ty (hook and loop cable tie), Panduit Extra-heavy cable tie (cable tie).
- B. Size for 25% spare capacity.
- C. Description:

1. Non-continuous cable supports shall provide a bearing surface of sufficient width to comply with required bend radii of high-performance cables; UL Listed.
2. Non-continuous cable supports shall have flared edges to prevent damage while installing cables.
3. Non-continuous cable supports sized 1 5/16" and larger shall have a cable retainer strap to provide containment of cables within the hanger. The cable retainer strap shall be removable and reusable and be suitable for use in air handling spaces.
4. Non-continuous cable supports shall have an electro-galvanized or G60 finish and shall be rated for indoor use in non-corrosive environments.
5. Stainless Steel non-continuous cable supports are intended for indoor and outdoor use in non-corrosive environments or where only mildly corrosive conditions apply.
6. Provide supports for cabling at no longer than 36" intervals.

### **3.12 STRUCTURED CABLING**

- A. CAT 6 UTP Horizontal Copper Cabling
- B. Manufacturer:
  1. General (Cable)
  2. Panduit NetKey (Jacks)
  3. Commscope Uniprise
  4. Berk-Tek / Leviton
  5. Mohawk (Cable)
  6. Belden (KeyConnect Jacks)
  7. Substitutions according to Div 01 and provisions of this section.
- C. Performance Requirement.
  1. Horizontal four pair Category 6 copper cabling system shall be capable of supporting 1000 Base-T applications for a total distance of 100 meters with equipment cords. System shall provide "future proof" channel performance and guaranteed margins as noted in this document and is guaranteed to exceed ANSI/TIA-568-C.2 Category 6 specifications for Insertion Loss, NEXT, PSNEXT, ELFEXT, PSELFEXT and Return Loss to 250 MHz.
  2. The System is Guaranteed 3.5 dB PSACR headroom at 250 MHz
- D. Product: Construction shall be four twisted pairs of 23 AWG insulated solid conductors, with a ripcord, surrounded by a tight outer jacket.
- E. Equal to General GenSPEED 6.
- F. UTP Standard Plenum, Category 6+.
- G. Jacket Color:
  1. Blue for data.
- H. Telecommunications Jacks.
  1. Equal to Panduit Mini-Com.
  2. Color: Verify and match existing jack color.
  3. The communication jack shall be POE (Power over Ethernet) verified and tested to meet 802.3af cable standards, including third party component verification. 100% manufacturer tested.
  4. Modular type RJ45 that snap into the four-port frame.
  5. 8 position/8 conductor modular jack, with flush mount, rear loading, snap in fitting.
  6. Jack shall be constructed with a punch type down termination method including a dust cover cap.
  7. Jack shall be labeled with universal wiring diagrams 568A and 568B.
  8. Jacks shall be available in multiple standard colors with optional color icon capabilities.
  9. Category 6 jack shall meet Category 6 component performance according to ANSI/TIA/EIA-568-C.2 requirements.

- I. Faceplates:
  - 1. Provide Equal to Panduit Mini-Com Classic Series.
  - 2. Accept a minimum of four (4) modular jacks. Provide (6) position faceplates if more than four jacks are shown on the drawings.
  - 3. Provide blank filler plates where extra ports are not used.
  - 4. Color to match adjacent wiring devices.
- J. Patch Panel: Equal to Panduit or Ortronics. Category 6, 24 or 48 port, 19" wide, flat front, labeling strip, rack mounted.

### **3.13 FIRE ALARM SYSTEM**

- A. Extend existing fire alarm system for device relocations as shown on the drawings. All wiring shall be in conduit. Only splice wiring within a junction box.
- B. Quality Assurance
  - 1. System Integrator: Company specializing in smoke detection, fire, and mass notification alarm systems with five years experience and that have personnel who possess a full knowledge and understanding of systems used for fire alarm and that have factory-trained personnel to perform system design installation, testing, training, and maintenance.
  - 2. Installation personnel shall be supervised by persons who are qualified and experienced in the installation, inspection, and testing of fire alarm systems.
  - 3. Each and all items of the Fire Alarm System shall be listed as a product of a single fire alarm system manufacturer under the appropriate category by Underwriters Laboratories, Inc. (UL), and shall bear the "UL" label.
  - 4. System shall be installed in accordance with NFPA 72.
  - 5. Manufacturer's Field Services: Provide services of a factory-authorized qualified service representative to supervise the field assembly and connection of components and the pretesting, and final testing.
  - 6. Pretesting: Determine, through pretesting, the conformance of the system to the requirements of the Drawings and Specifications. Correct deficiencies observed in pretesting. Replace malfunctioning or damaged items with new and retest until satisfactory performance and conditions are achieved.
  - 7. Final Testing:
    - a. Notice: Provide a 10-day minimum notice in writing when the system is ready for final acceptance testing.
    - b. Minimum System Tests: Test the system according to the procedures outlined in NFPA 72.
    - c. Retesting: Correct deficiencies indicated by tests and completely retest work affected by such deficiencies. Verify by the system test that the total system meets the Specifications and complies with applicable standards.
    - d. Final Test, Certificate of Completion, and Certificate of Occupancy: Test the system as required by the Authority Having Jurisdiction.
    - e. Report of Tests and Inspections: Provide a written record of inspections, tests, and detailed test results in the form of a test log.
- C. Manufacturer: Existing system is manufactured by Simplex. Extend existing system as shown on the drawings with new devices as shown. All new devices shall be compatible with existing system and shall match existing devices. Verify and match existing wiring style for notification, signaling, and initiation circuits.
- D. Provide all devices, accessories, wiring, connections, and programming to accommodate new devices shown.
- E. Audible Alarm Notification: By horns in all areas as indicated on drawings. Verify and match existing.
- F. Smoke Sensors

1. General: Comply with UL 268, "Smoke Detectors for Fire Protective Signaling Systems." Include the following features:
  2. Addressable Photoelectric type ceiling mounted smoke sensor with automatic drift compensation.
  3. Devices to be compatible with existing system and wiring.
  4. Install per NFPA 72. Alarm Notification Appliances
  5. Devices shall match existing and be compatible with existing system. All devices to be UL listed.
  6. Chimes: UL Listed Chime device to match existing.
  7. Horn: Piezoelectric type horn shall be listed to UL 464. The horn shall have a minimum sound pressure level of 85 dBA @ 24VDC. The horn shall mount directly to a standard single gang, double gang or 4" square electrical box, without the use of special adapter or trim rings.
  8. Visible/Only: Strobe shall be listed to UL 1971. The V/O shall consist of a xenon flash tube and associated lens/reflector system. The V/O enclosure shall mount directly to standard single gang, double gang or 4" square electrical box, without the use of special adapters or trim rings. V/O appliances shall be provided with different minimum flash intensities of 15cd, 75cd and 110cd. Provide a label inside the strobe lens to indicate the listed candela rating of the specific Visible/Only appliance.
  9. Audible/Visible: Combination Audible/Visible (A/V) Notification Appliances shall be listed to UL 1971 and UL 464. The strobe light shall consist of a xenon flash tube and associated lens/reflector system. Provide a label inside the strobe lens to indicate the listed candela rating of the specific strobe. The horn shall have a minimum sound pressure level of 85 dBA @ 24VDC. The audible/visible enclosure shall mount directly to standard single gang, double gang or 4" square electrical box, without the use of special adapters or trim rings.
  10. Notification Appliance Circuit provides synchronization of strobes at a rate of 1Hz and operates horns with a Temporal Code Pattern operation. The circuit shall provide the capability to silence the audible signals, while the strobes continue to flash, over a single pair of wires. The capability to synchronize multiple notification appliance circuits shall be provided.
- G. Provide wiring per manufacturers recommendations.
- H. All final connections shall be by equipment supplier.
- I. Install system components and all associated devices in accordance with manufacturer's approved shop drawings, applicable Building Codes, Fire Codes, and NFPA Standards. All devices shall be mounted and installed to comply with NFPA 72 and to meet ADA requirements.
- J. Fire Alarm Wire:
1. Provide wiring as recommended by manufacturer and by system vendor in compliance with local codes.
  2. Match existing wiring style and configuration for initiation and notification circuits. All new conductors and to be installed in conduit.
  3. Conductors shall comply with NFPA 70 Article 760. Conductors shall be stranded copper.
  4. Number and size of conductors will be as specified by the manufacturer (not less than 18 AWG for SLCs and IDCs, and 14 AWG for NACs). All wires shall be color coded as suggested by the Manufacturer.
  5. Power Limited Circuits: 300-volt minimum rated.
  6. Non-Power Limited Circuits: 600-volt minimum rated.
  7. Provide wiring appropriate for installation exposed in plenum space with no raceway.
    - a. Wiring shall be routed through spaces parallel to the building lines, not diagonally through the space.

- b. Fire alarm wiring shall be independently supported and shall not share supports with other low voltage or other systems. Supports shall be provided a maximum of 36" apart. Do not support cabling from mechanical installations or other electrical installations. Wiring shall be installed above ductwork, piping, conduit, etc. wherever possible to limit future interactions and conflicts.
- c. Splices shall only be made within boxes or enclosures.

### **PART 3 EXECUTION**

#### **4.01 EXAMINATION**

- A. Verify conditions and constructions types prior to installation. Verify that surfaces that support Product(s) are ready to receive them. Examine location of equipment installation for compliance with installation tolerances and other conditions affecting performance of Work
- B. Prepare drawings showing proposed rearrangement of work to meet Project conditions, including changes to work specified in other Divisions. Obtain permission of Architect before proceeding.
- C. Review all Drawings including architectural, mechanical, structural, civil, and electrical drawings for extent of Work.
- D. Examine equipment to ensure equipment is ready for electrical connection, wiring, and energization.

#### **4.02 PREPARATION**

- A. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections. Determine connection locations and requirements.
- B. Sequence and coordinate work with other trades so as to avoid conflict of space and time sequence. If interference develops, the matter shall be brought to the attention of the Architect for decision.
- C. The Contractor shall coordinate exact routing and lengths required where conduit destination is indicated and routing is not shown.
- D. Demolition:
  - 1. Notify the Owner and Architect at least five (5) days prior to commencing demolition operations
  - 2. Verify existing circuiting arrangements and control apparatus and wiring. Verify that abandoned wiring and equipment serve only abandoned facilities.
  - 3. Review existing equipment and materials with the Owner, schedule or indicate equipment to be salvaged for re-use and equipment to be salvaged and turned over to the Owner.
- E. Extension of existing circuits and or systems: Prior to connecting any new Work to existing circuits or systems Contractor shall provide field measurements and surveys required to ensure adequate capacity is available for new connections.

#### **4.03 WORKMANSHIP**

- A. All workmanship shall be neat and complete in both effectiveness and appearance and shall be executed by persons licensed and skilled in the trade. Engineer reserves the right to reject any material or workmanship before, during or after construction.
- B. Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products.

#### **4.04 DEMOLITION AND REMODELING**

- A. Preparation
  - 1. Notify the Owner and Architect at least five (5) days prior to commencing demolition operations.

2. Demolition Drawings are based on field observation and existing record documents. Report discrepancies to Architect before disturbing existing installation.
3. Verify existing circuiting arrangements and control apparatus and wiring.
4. Verify that abandoned wiring and equipment serve only abandoned facilities.
5. Review existing equipment and materials with the Owner, schedule or indicate equipment to be salvaged for re-use and equipment to be salvaged and turned over to the Owner.
6. Beginning of demolition means Contractor accepts existing conditions.
7. Extension of existing circuits and/or systems: Prior to connecting any new Work to existing circuits or systems Contractor shall provide field measurements and surveys required to ensure adequate capacity is available for new connections.

B. Installation

1. General Demolition
  - a. Remove, relocate, and extend existing installations to accommodate new construction.
  - b. Where indicated or required, remove existing electrical systems in walls, floors, and ceilings scheduled for removal.
  - c. Where abandoned wiring serves equipment and / or facilities not indicated to be removed Contractor shall extend and / or reroute wiring to maintain service to the equipment that shall remain.
  - d. Repair adjacent construction and finishes damaged during demolition and extension work.
  - e. Maintain access to existing electrical installations which remain active. Modify installation or provide access door unit as appropriate.
2. Raceway and Box Demolition:
  - a. Remove all abandoned conduit, unless indicated to remain for re-use or future work, including abandoned conduit exposed during demolition and located above accessible ceilings.
  - b. Cut concealed abandoned conduit flush with walls and floors that are indicated to remain.
  - c. Remove abandoned boxes if conduit servicing them is removed.
  - d. Provide appropriate blank cover for abandoned boxes which are not removed.
  - e. Disconnect and remove abandoned panelboards and distribution equipment as indicated.
3. Conductor and Cabling Demolition:
  - a. Remove all abandoned conductors and cabling in their entirety.
  - b. Remove demolished branch circuits all the way back to the panel.
4. Equipment Demolition:
  - a. Where indicated or required, remove all luminaires, stems, brackets, hangers, supports, etc.
  - b. Remove, demount, and disconnect existing electrical materials and equipment indicated to be salvaged, and deliver same to the location designated for storage. Leave in good condition and store in orderly manner.
  - c. Remove from the site and legally dispose of demolished materials and equipment not indicated to be salvaged.
5. Maintain existing systems in service until new systems are complete and ready for use.
  - a. Disable existing systems only to make switchovers and connections.
  - b. Notify Architect, Construction Manager, and Owner and obtain permission before partially or completely disabling systems.
  - c. Minimize outage duration and coordinate time with Owner at his convenience.
  - d. Make temporary connections to maintain service, feeders and branch circuits when outage time exceeds 8 hours or more.

#### **4.05 CUTTING, PATCHING, AND FINISHING**

- A. General: Perform cutting, patching and finishing in accordance with Division 01.
  - 1. Cut, remove, and legally dispose of material including but not limited to construction material, and other indicated material made obsolete by the new work.
  - 2. Protect the structure, furnishings, finishes, and adjacent materials and installations not indicated or scheduled to be cut or removed.
  - 3. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt into adjacent areas.
  - 4. The Contractor shall not endanger the stability of the structure by cutting, excavation or otherwise.
  - 5. Do not cut or alter work of any other trade without trade and Architect / Engineer's consent.
- B. Perform cutting, patching and finishing of walls, floors, ceilings, roofs required to:
  - 1. Uncover work to provide for installation of new or ill-timed work.
  - 2. Remove and replace defective work.
  - 3. Remove samples of installed work as specified for testing.
- C. Upon written instructions from the Architect / Engineer, uncover and restore work to provide for Engineer's observation of concealed work.
- D. In existing construction:
  - 1. Electrical Contractor shall perform all cutting required and all necessary patching and finishing after completion to restore surfaces to original condition, unless otherwise indicated.
  - 2. Use experienced installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched and finished. Works shall meet Project engineer's approval.
- E. In new construction:
  - 1. General Contractor will provide chases and openings in walls, floors, ceilings, partitions, etc., where shown or necessary to receive electrical work, but the Electrical Contractor shall furnish full information as to locations, dimensions etc., of such chases and openings including provision and proper setting of sleeves and other equipment in such time as to cause no delay to work of General Contractor.
- F. Should any cutting be required for proper installation of electrical work because of failure to give the General Contractor the proper information at the time required, such cutting shall be done at the Electrical Contractors expense.

#### **4.06 INSTALLATION**

- A. Installation shall comply with the industry standards referenced above and manufacturer's installation instructions.
- B. Wiring Methods:
  - 1. Single conductors type THHN/THWN in raceway.
  - 2. Make connections to equipment with flexible metal conduit or liquid tight flexible metal conduit.
  - 3. Make connections to luminaires with flexible metal conduit or factory furnished flexible fixture whips.
  - 4. Flexible metallic conduit is generally not acceptable except where noted above.
  - 5. Exposed raceway is generally not acceptable except in electrical, mechanical rooms or unfinished spaces. Coordinate with Owner and Architect or Engineer prior to installation of surface raceway.
  - 6. Connectors: Use split bolt connectors for splices and taps, 8 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation

rating of conductor. For 10 AWG and smaller copper conductor splices and taps use insulated spring wire connectors with plastic caps 10 AWG and smaller.

7. Where multiple neutral conductors are installed within a single conduit provide neutral conductors with a tracer (color corresponding to the color of the phase conductor).
- C. Receptacles:
1. Install receptacles with grounding pole on bottom.
  2. Install GFCI receptacles where located in bathrooms, kitchens, garages, outdoors, or within six feet of water source.
  3. Install weather resistant devices in all Damp and Wet locations per NEC 406.8.
- D. Luminaires
1. Lay-in luminaires shall be secured to the building's structure at minimum of two points (other than the acoustical tile ceiling grid).
- E. Grounding and Bonding shall comply with the regulatory requirements and industry standards referenced above. Specifically, NFPA 70 NEC Article 250. Provide a separate continuous copper equipment grounding conductor with all feeders and branch circuits.
- F. Penetrations:
1. Effectively seal penetrations in exterior walls, roofs, and rated interior walls in accordance referenced standards and regulatory requirements.
  2. Seal all conduits and cables passing through all floors, all walls, and all ceilings for the purpose of sound, heat, smoke and moisture control. Use material suitable for the wall construction (confirm suitability of material with Engineer or Architect prior to installation). Place sealing material around each conduit and raceway for the full thickness of the wall
  3. No roof penetrations will be allowed.
- G. Pathway for Structured Cabling:
1. Comply with ANSI/ TIA/ EIA 569 - Commercial Building Standard for Telecommunications Pathways and Spaces.
  2. Minimum conduit size shall be ¾". Unless noted otherwise, outlet rough-ins shall consist of 4" square deep box with single gang ring and ¾" raceway routed to the accessible ceiling space.
  3. Where non-continuous cable supports are used cable shall be supported at maximum intervals of 36".
- H. Structured Cabling:
1. Each jack shall be cabled directly from the telecommunication room to the remote outlet location via the communications cabling pathway (no splices) unless noted otherwise.
  2. Maximum horizontal cabling length: 295 feet.
  3. Wire all jacks according to ANSI/TIA/EIA T568-B configuration.
  4. Terminations: Voice - 110 blocks. Data - patch panel. Or to match existing.
  5. Provide 25% spare capacity at patch panels, wiring blocks, and cabling pathway.

#### **4.07 IDENTIFICATION**

- A. Junction Boxes: Provide label indicating voltage, panelboard, circuit number, and description of system (e.g. general use, interruptible, life safety).
- B. Receptacles: Identify panelboard and circuit number serving device. Self-adhesive labels, black filled lettering on clear background.
- C. Panelboards: Provide typed panelboard directory (revised typed directories for existing panels modified). Provide engraved nameplate with designation, feeder size, source of feeder, voltage and phase.
- D. Disconnects and Motor Controllers: Provide adhesive label with designation of equipment controlled / feeding, circuit size, source of circuit, voltage, phase, and auxiliary control device.

- E. Provide self-adhesive label for piloted lighting switches, exhaust fans, relays, contactors, time switches, communications faceplates (e.g. phone / data plates), and control panels. Coordinate description on label with Engineer.
- F. See the drawings for additional labeling requirements.
- G. Color code secondary service, feeder, and branch circuit conductors to match existing or, if no color code exists, as follows:
 

1. Voltage	Phase A	Phase B	Phase C	Neutral Grounding & Bonding
2. 208/120	Black	Red	Blue	White
3. 480/277	Brown	Orange	Yellow	Gray
				Green
- H. Structured Cabling: Provide wire markers at each end of each cable, provide labeling each jack, each patch panel port, and each wiring block termination. Coordinate labeling convention with Owner and Engineer.
- I. Communications Labeling and Identification:
  - 1. All communications equipment racks, cabinets, backboards and other termination hardware shall be labeled at the top left hand corner of each piece of equipment. With a minimum  $\frac{3}{4}$ " high identification label, identifying the room and rack location numbering system.
  - 2. All communication copper and fiber patch panels shall be labeled with a minimum  $\frac{3}{8}$ " high identification label identifying panels and sequential port numbering system.
  - 3. All face plates locations shall be labeled with a minimum  $\frac{3}{16}$ " high label indicating the room rack, patch panel and port number.
  - 4. No hand written labeling will be allowed.
  - 5. Provide a clear and distinct label for each cable at both ends.
  - 6. The chosen alphanumeric labeling system shall be coordinated with and approved by Owner prior to any permanent labelling being installed.
  - 7. Cables shall be identified at each end. Same designation shall be used at both ends.
    - a. A basic labelling convention of sequential numbering shall be used.
    - b. Provide wire markers as follows for horizontal UTP copper cabling in the following format
      - 1) Telecommunications Room Name / Outlet Room Number / Cable Function / Faceplate Number
      - 2) Example: TTTT / XXXX / D (for Data) or V (for Voice) / 01-99
      - 3) Label cables within outlet boxes and within 4" of each termination.
  - 8. Outlet faceplates shall be identified.
    - a. Room number – faceplate sequence within room (clockwise from north) – X# where X indicates use (D for data, V for voice, W for wi-fi, C for coax CATV) and # is the jack sequence (clockwise from top right).
  - 9. IDC style connecting hardware shall be color coded per the code identified the BICSI TDMM.

#### 4.08 FIELD QUALITY CONTROL

- A. Inspect each piece of electrical equipment for defects.
- B. Replace defective drivers. Replace broken electrical and luminaire parts.
- C. Adjusting:
  - 1. Adjust wall plates to be level.
  - 2. Adjust devices to be flush and secure behind wall plates.
  - 3. Contractor shall, under actual operation, make amperage tests and circuit adjustments required to produce a balanced phase loading. Revise panel circuit directories as required
- D. Cleaning:
  - 1. Clean exposed surfaces of equipment to restore finish. Clean photometric surfaces of luminaires.

2. Remove wire and insulation scraps and vacuum clean inside each panelboard, switchboard, starter, contactor, motor control center, disconnect switch, etc. Clean the interior of boxes to remove dust, debris and other material.
3. Scratches on painted surfaces shall be touched up with paint of equivalent quality and matching color.

#### **4.09 FIELD TESTING**

- A. Operate each wall switch with circuit energized and verify proper operation. Verify that each receptacle device is energized. Test each receptacle device for proper polarity.
- B. Test each GFCI receptacle device for proper operation.
- C. Test tightness of bolted electrical connections with calibrated torque wrench.
- D. Take voltage and amperage measurements at each panelboard and disconnect switch with equipment served in operation.
- E. Test connections to equipment for proper phase rotation.
- F. Test each new communications cable/jack in accordance with the ANSI/TIA-568 C industry standards. Include test report with the O&M manual.
- G. Test fire alarm system per NFPA 72 guidelines. Provide written test results for the system.
- H. Test report: Provide test report for each test performed. Report shall indicate date and time of test, personnel performing test, note condition of equipment (e.g. any defects), location of equipment, description of test, result of test (test data), other remarks (analysis and recommendations), description of modification made for improvement if applicable.

**END OF SECTION**

**SECTION 31 2200  
SITE GRADING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Subgrade Preparation-Pavements.

**1.02 DEFINITIONS**

- A. Subgrade: Top of excavation or fill material located at the bottom of the aggregate at pavement areas .

**PART 2 PRODUCTS-NOT USED**

**PART 3 EXECUTION**

**3.01 PREPARATION**

- A. Protect existing utilities from damage.
  - 1. The contractor shall contact Gopher State One Call at 800-252-1166 prior to beginning any excavation work.
    - a. Also contact the Owner's Representative for private site utility locations.
  - 2. The contractor shall notify the various utility companies if work will expose, affect, or endanger any existing utility.
  - 3. The contractor shall support, protect or relocate existing utilities affected by the work.
    - a. Means and methods shall be approved by the utility owner.
- B. Identify required lines, levels, contours, and datum.
- C. Provide temporary means and methods to remove all standing or ponding water from areas prior to grading.
- D. Protect site features to remain, including but not limited to paving, from damage by grading equipment and vehicular traffic.

**3.02 SITE GRADING**

- A. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack surface water control.
- B. Compaction methods and finish densities shall meet requirements listed in Sections 31 2324.

**3.03 SUBGRADE PREPARATION-PAVEMENT**

- A. Compact and shape the subgrade to produce the required density and stability of the subgrade at the required elevation.
  - 1. Density and stability shall be in-place at the time the aggregate base and/or geotextile fabric is placed.
  - 2. The required stability shall be such that no rutting or displacement of the subgrade shall occur from construction equipment.
- B. Compaction Density as per ASTM D698-Standard Proctor, unless otherwise specified or indicated.
  - 1. Scarify the soils at the new subgrade elevation and recompact the soils to a minimum 95 percent of maximum dry density.
    - a. 8 inches, minimum, within vehicular pavement areas (or remove and replace, if necessary, to reach 8 inch depth)
      - 1) Recompact with at least 5 passes of a large roller with a minimum drum diameter of 3-1/2 feet.
    - b. Moisture condition the soils as necessary after scarifying and prior to recompacting.
- C. The required stability shall be such that no rutting or displacement of the subgrade shall occur from construction equipment.

- D. Completed subgrade shall be within 1/2 inch of plan elevation.
- E. Proofroll vehicular pavement subgrades prior to placing geotextile fabric and/or aggregate.
  - 1. Proofroll shall be observed by a geotechnical engineer to determine if the results of the procedure meet the project specifications.
    - a. Proofroll with a fully aggregate loaded tandem-axle truck.
    - b. The Contractor shall correct areas that display excessive yielding or rutting during the proofroll, as determined by the geotechnical representative.
      - 1) Corrections shall include, as necessary, moisture conditioning and recompaction, and subcutting and replacement of soil.
- F. Tolerances
  - 1. Completed subgrade shall be within 1/2 inch of plan elevation.
- G. Placement of aggregate and/or geotextile fabric shall not take place until results of the proofroll are known, the final elevations have been checked, and given notice to proceed from the Owner's Representative.

#### **3.04 SOIL REMOVAL**

- A. Remove excess topsoil from site.

#### **3.05 TOLERANCES**

- A. Top Surface of Subgrade: Plus or minus 0.04 foot (1/2 inch) from required elevation.
- B. Top Surface of Finish Grade: Plus or minus 0.04 foot (1/2 inch).

#### **3.06 REPAIR AND RESTORATION**

- A. Existing Facilities, Utilities, and Site Features to Remain: If damaged due to this work, repair or replace to original condition.

**END OF SECTION**

**SECTION 31 2317  
SITE EXCAVATION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Excavating for improvements shown on Civil Drawings.

**1.02 DEFINITIONS**

- A. Subgrade: Top of excavation or fill located at the bottom of the aggregate at pavement areas.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that survey bench mark and intended elevations for the work are as indicated.

**3.02 PREPARATION**

- A. Identify required lines, levels, contours, and datum locations.
- B. Contact Gopher State One Call at 800-252-1166 prior to any excavation work.
  - 1. Also contact the Owner's Representative for private site utility locations.
- C. Locate, identify, and protect utilities that remain and protect from damage.

**3.03 EXCAVATING**

- A. Excavate to accommodate construction operations.
- B. Do not interfere with 45 degree bearing splay of foundations.
- C. Hand trim excavations. Remove loose matter.
- D. Correct areas that are over-excavated and load-bearing surfaces that are disturbed; see Section 31 2324.
- E. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- F. Remove unsuitable existing soils encountered during excavation operations.
- G. Subgrade Preparation.
  - 1. Per Specification 31 2200 Site Grading.
- H. Remove excavated material that is unsuitable for re-use from site.
- I. Remove excess excavated material from site.

**3.04 PROTECTION**

- A. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

**END OF SECTION**

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**SECTION 31 2318  
SITE TRENCHING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Backfilling and compacting for site utilities.

**1.02 DEFINITIONS**

- A. Subgrade: Top of excavation or fill located at the bottom of the aggregate at pavement areas.

**PART 2 PRODUCTS**

**2.01 FILL MATERIALS**

- A. General Fill: Subsoil excavated on-site.
  - 1. Free of lumps larger than 3 inches, rocks larger than 2 inches, organic materials/soils and debris.
- B. Site Pipe Bedding.
  - 1. Free of silt, clay, loam, friable or soluble materials, and organic matter.
  - 2. Graded in accordance with ASTM C136, within the following limits.
    - a. 1 IN Sieve: 100 percent passing.
    - b. 3/4 IN Sieve: 90 to 100 percent passing.
    - c. 3/8 IN Sieve: 50 to 90 percent passing.
    - d. No. 4 Sieve: 35 to 80 percent passing.
    - e. No. 10 Sieve: 20 to 65 percent passing.
    - f. No. 40 Sieve: 10 to 35 percent passing.
    - g. No. 200 Sieve: 3 to 10 percent passing.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that survey bench marks and intended elevations for the work are as indicated.

**3.02 PREPARATION**

- A. Contact Gopher State One Call at 800-252-1166 prior to beginning any excavation work.
  - 1. Also contact the Owner's Representative for private site utility locations.

**3.03 TRENCHING**

- A. The contractor shall install the necessary trench support to meet the soil conditions and to protect existing structures and property.
- B. Remove unsuitable existing soils.
- C. Do not interfere with 45 degree bearing splay of foundations.
- D. Trench widths shall be sufficient to permit the pipe to be installed properly.
- E. Hand trim excavations. Remove loose matter.
- F. Correct areas that are over-excavated and load-bearing surfaces that are disturbed.
- G. Remove excavated material that is unsuitable for re-use from site.
- H. Remove excess excavated material from site.
- I. Provide temporary means and methods, as required, to remove all water from trenching operations.
  - 1. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water.

**3.04 PREPARATION FOR UTILITY PLACEMENT**

- A. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

- B. Cut out soft areas of subgrade not capable of compaction in place.
  - 1. Backfill with 3/4 to 1-1/2 inch crushed rock to prevent settlement and provide support for the pipe.
- C. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.
- D. Backfill all trenches at the end of each work day or provide an acceptable method of protecting the trench area while work in not being performed.

### **3.05 BACKFILLING**

- A. Provide Site Pipe Bedding per the Drawing Details.
- B. Backfill to match existing finish grade elevations using unfrozen materials.
- C. Employ a placement method that does not disturb or damage other work.
- D. Maintain optimum moisture content of fill materials to attain required compaction density.
- E. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches loose lifts or less when heavy, self propelled compaction equipment is used.
  - 1. 4 to 6 inches in loose thickness when hand-guided equipment (ie. jumping jack, plate compactor, etc.) is used.
  - 2. Compaction of site pipe bedding material shall not exceed 6 inch lifts to a point of at least 12 inches above the top of pipe.
    - a. Compaction of these initial lifts shall be accomplished with hand-operated tampers/compactors.
- F. Compaction Density as per ASTM D698.
  - 1. 95 percent of maximum dry density, minimum.
- G. Subgrade Preparation.
  - 1. Per Specification 31 2200-Site Grading.

### **3.06 CLEANING**

- A. Remove unused materials, leave area in a clean and neat condition.

**END OF SECTION**

**SECTION 31 2324  
SITE FILL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Filling and compacting for work shown on the Civil Drawings.

**1.02 DEFINITIONS**

- A. Subgrade Elevations: Top of excavation or fill material located at the bottom of the aggregate at pavement areas.

**PART 2 PRODUCTS**

**2.01 FILL MATERIALS**

- A. General Fill: Subsoil excavated on-site.
  - 1. Graded.
  - 2. Free of lumps larger than 3 inches, rocks larger than 2 inches, organic materials/soils and debris.
- B. Imported Subsoil to be used as General Fill, if necessary.
  - 1. Natural, non-organic soils native to the project area.
    - a. Similar to existing on-site subsoils.
  - 2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.

**PART 3 EXECUTION**

**3.01 PREPARATION**

- A. Compaction Density as per ASTM D698-Standard Proctor, Unless Otherwise Specified or Indicated:
  - 1. Scarify a minimum of 8 inches of the exposed soils at existing grade prior to placing fill and recompact the soils to a minimum 95 percent of maximum dry density.
    - a. Maintain optimum moisture content of fill materials to attain required compaction density.

**3.02 FILLING**

- A. Fill to contours and elevations indicated using unfrozen materials.
- B. Fill up to subgrade elevations unless otherwise indicated.
- C. Employ a placement method that does not disturb or damage other work.
- D. Maintain optimum moisture content of fill materials to attain required compaction density.
- E. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches loose lifts or less when heavy, self propelled compaction equipment is used.
  - 1. 4 to 6 inches in loose thickness when hand-guided equipment (ie. jumping jack, plate compactor, etc.) is used.
- F. Correct areas that are over-excavated.
- G. Compaction Density as per ASTM D698-Standard Proctor, Unless Otherwise Specified or Indicated:
  - 1. 95 percent of maximum dry density.
- H. Subgrade Preparation.
  - 1. Per Specification 31 2200 Site Grading.

**3.03 TOLERANCES**

- A. Top Surface of General Filling: Plus or minus 1 inch from required elevations.
- B. Completed subgrade shall be within 1/2 inch of plan elevation.

### **3.04 CLEANING**

- A. Remove unused stockpiled materials, leave area in a clean and neat condition.

**END OF SECTION**

**SECTION 32 1123  
SITE AGGREGATE COURSES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Aggregate Base Course.

**1.02 REFERENCE STANDARDS**

- A. Minnesota Department of Transportation Standard Specifications for Construction, 2025 Edition.

**1.03 SUBMITTALS**

- A. Sieve analysis of aggregate prior to start of construction and during construction.

**PART 2 PRODUCTS**

**2.01 MATERIALS**

- A. Aggregate Base.
  - 1. Aggregate Class 5.
    - a. Coarse aggregate, conforming to Reference 1.02.A.
      - 1) Contractor shall have the option of using Recycled Materials.
        - (a) Shall meet the requirements of Section 3138 of Reference 1.02.A.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that survey bench marks and intended elevations for the work are as indicated.
- B. Verify substrate has been inspected, gradients and elevations are correct, and is dry.

**3.02 PREPARATION**

- A. Correct irregularities in subgrade gradient and elevation by scarifying, reshaping, and re-compacting.
- B. Do not place aggregate on soft, muddy, or frozen surfaces.

**3.03 INSTALLATION**

- A. Place aggregate in maximum 4 inch layers and compact to specified density.
  - 1. Compact to a minimum of 95 percent of maximum dry density as per ASTM D698.
    - a. Use mechanical tamping equipment in areas inaccessible to compaction equipment.
    - b. Maintain optimum moisture content of fill materials to attain required compaction density.
  - 2. The required stability shall be such that no rutting or displacement of the aggregate surface shall occur from construction vehicles and equipment used during the placement of the next layer of the pavement section.

**3.04 TOLERANCES**

- A. Flatness: Maximum variation of 1/2 inch measured with 10 foot straight edge.
- B. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- C. Scheduled Compacted Thickness: Within 1/2 inch.
- D. Variation From Design Elevation: Within 1/2 inch.

**3.05 CLEANING**

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

**END OF SECTION**

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**SECTION 32 1216  
SITE ASPHALT PAVEMENT**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Plant Mixed Asphalt Paving.
- B. Bituminous Tack Coat.

**1.02 REFERENCE STANDARDS**

- A. Standard Specifications for Construction, Minnesota Department of Transportation, 2025 edition.

**1.03 SUBMITTALS**

- A. Asphalt mix design.

**1.04 QUALITY ASSURANCE**

- A. Obtain materials from same source throughout.

**PART 2 PRODUCTS**

**2.01 ASPHALT PAVING MIXES AND MIX DESIGN**

- A. Asphalt mixtures per Reference 1.02.A.
  - 1. Wear Course.
    - a. SPWEA230C.
  - 2. Non-Wear Course.
    - a. SPNWB230C.
- B. Tack Coat.
  - 1. CSS-1 or CSS-1h.
  - 2. Shall meet ASTM D2397.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that compacted aggregate base is dry and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.

**3.02 PREPARATION - TACK COAT**

- A. Apply tack coat between lifts at uniform rate of 0.05 gal/sq yd.
  - 1. Tack coat will be diluted prior to application with water at a 50-50 ratio.
- B. Apply tack coat to contact surfaces of curbs, gutters and edge of abutting pavements.

**3.03 PLACING ASPHALT PAVEMENT**

- A. Place asphalt course within 24 hours of applying tack coat.
- B. Construct in accordance with Reference 1.02.A.
  - 1. Compaction shall follow the Ordinary Compaction method.
- C. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

**3.04 TOLERANCES**

- A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- B. Compacted Thickness: Within 1/4 inch of specified or indicated thickness.
- C. Variation from True Elevation: Within 1/2 inch.

### **3.05 PROTECTION**

- A. Immediately after placement, protect pavement from mechanical injury for 2 days or until surface temperature is less than 140 degrees F.

**END OF SECTION**

**SECTION 32 1313  
SITE CONCRETE PAVEMENT**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Concrete for site pavements.

**1.02 SUBMITTALS**

- A. Product Data: Provide data on joint filler, admixtures, curing compound, and all other materials specified.
- B. Concrete Mix Design.
  - 1. Employ independent testing laboratory to test proposed aggregate and design concrete mixes for each type of concrete required.
    - a. Submit aggregate test reports and mix designs.
      - 1) Test each type of fine and coarse aggregate for conformance to ASTM C33.
  - 2. Fly Ash Certificate of Compliance, if applicable.

**PART 2 PRODUCTS**

**2.01 FORM MATERIALS**

- A. Form Materials: Conform to ACI 301.
- B. Preformed Joint Filler:
  - 1. Thickness: 1/2 inch.
  - 2. Shall be one of the following:
    - a. Non-extruding bituminous type preformed joint filler meeting ASTM D1751.
    - b. Semi-rigid, closed-cell polypropylene foam, preformed joint filler meeting ASTM D8139.

**2.02 REINFORCEMENT**

- A. Reinforcing Steel: ASTM A615, Grade 60 - 60,000 psi yield strength; deformed billet steel bars; unfinished.

**2.03 CONCRETE MATERIALS**

- A. Obtain cementitious materials from same source throughout.
- B. Cement: ASTM C150 Normal - Type I portland type, grey color.
- C. Fine and Coarse Mix Aggregates: ASTM C33.
  - 1. Coarse Aggregate shall meet Size Number 57 or 67.
  - 2. The following percentages shall not be exceeded for the Course Aggregate.
    - a. Shale.
      - 1) Sidewalks.
        - (a) Maximum 0.5% by weight of the plus No. 4 fraction.
      - 2) All other.
        - (a) Maximum 3% by weight of the plus No. 4 fraction.
    - b. Iron Oxide Particles.
      - 1) Maximum 4.0% by weight of the plus No. 4 fraction.
- D. Fly Ash: ASTM C618, Class C or F.
- E. Water: Clean, and not detrimental to concrete.
- F. Air-Entraining Admixtures: ASTM C260.
- G. Chemical Admixtures: ASTM C494, Type A - Water Reducing.
  - 1. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
    - a. Admixtures containing calcium chloride is prohibited.

## **2.04 ACCESSORIES**

- A. Rebar Chairs.
  - 1. Rebar shall be held in-place with manufactured bar chair supports with base.
- B. Curing Compound: ASTM C309, Type 2, Class A.
- C. Joint Sealer
  - 1. One-part, cold applied, non-sag silicone sealant.
    - a. ASTM D5893, Type NS.
  - 2. Movement capability.
    - a. 100% extension.
    - b. 50% compression.
  - 3. Weather and UV Resistant.
  - 4. Shall be tooled.
  - 5. Color: Gray.
  - 6. Shall be one of the following.
    - a. Dow Corning 888 Non-Sagging Silicone.
    - b. Tremco Spectrum 800.
    - c. Or equal.

## **2.05 CONCRETE MIX DESIGN**

- A. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.
- B. Concrete Properties:
  - 1. Compressive strength, when tested in accordance with ASTM C39 at 28 days; 4500 psi.
  - 2. Fly Ash Content: Maximum 30 percent of cementitious materials by weight.
  - 3. Cement Content: Minimum 564 lb per cubic yard.
  - 4. Water-Cement Ratio: Maximum 45 percent by weight.
  - 5. Total Air Content: 7 percent (Mix Design Target) , determined in accordance with ASTM C173.
    - a. Placed concrete shall be within -1.5 to +2 percentage points of target value.

## **2.06 MIXING**

- A. Concrete shall be Ready-Mixed concrete, mixed and delivered in accordance with ASTM C94.
- B. Transit Mixers: Comply with ASTM C94.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify compacted aggregate base is acceptable and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.

### **3.02 SUBBASE**

- A. See Section 32 1123 for construction of base course for work of this Section.

### **3.03 PREPARATION**

- A. Moisten base to minimize absorption of water from fresh concrete.

### **3.04 FORMING**

- A. Place and secure forms to correct location, dimension, profile, and gradient.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

### **3.05 REINFORCEMENT**

- A. Place reinforcement at midheight of slabs-on-grade.

### **3.06 COLD AND HOT WEATHER CONCRETING**

- A. Follow recommendations of ACI 305R when concreting during hot weather.
- B. Follow recommendations of ACI 306R when concreting during cold weather.
- C. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

### **3.07 PLACING CONCRETE**

- A. Place concrete in accordance with ACI 304R.
- B. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.
- C. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

### **3.08 TEMPORARY CONCRETE WASHOUT**

- A. Provide at a defined area on site or to an area designated for cement washout.
- B. Shall be of sufficient size to contain the wash water and residual cement.

### **3.09 JOINTS**

- A. Place Isolation and Contraction Joints at locations shown in the drawings and as per the drawing details.
  - 1. Provide early-entry cutting of contraction joints while concrete is in its 'green' state to reduce the potential for random micro-cracking.
  - 2. Do not seal contraction joints.
- B. Construction Joints shall be placed as per the drawing details.
  - 1. Seal construction joints.

### **3.10 FINISHING**

- A. Do not add water to surface of concrete during finishing operations.
- B. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radiused edge 1/4 inch radius.
  - 1. Concrete Sidewalk-Thickened Edge shall have a 1 inch radius on the exposed side.
- C. Curbs and Gutters: Light broom, texture parallel to pavement direction.
- D. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.
  - 1. Contractor shall ensure spraying equipment supplies an even and 100% coverage of curing compound to the concrete surface.

### **3.11 TOLERANCES**

- A. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.
- B. Maximum Variation From True Position: 1/4 inch.

### **3.12 PROTECTION**

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

### **3.13 PERFORMANCE**

- A. Remove and replace all concrete pavements (pavement, sidewalk, curb & gutter, etc.) where uncontrolled cracks have occurred within the first year of installation at no cost to the Owner.
  - 1. Remove and replace panel or section to the nearest joint.

### **END OF SECTION**

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**SECTION 32 3113  
SITE CHAIN LINK FENCES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Fence framework, fabric.
- B. Excavation for post bases .
- C. Gates.
- D. Accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 32 1313 Site Concrete Paving: Concrete for footings.

**1.03 SUBMITTALS**

- A. Product Data: Provide data on fabric, posts, accessories, fittings and hardware.

**1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications.
  - 1. Manufacturer of the fence framework, fabric, and accessories shall specialize in manufacturing these products, with not less than three years of experience.
- B. Installer of fence shall have experience in the installation of their respective work.
- C. Materials, design, and installation shall meet the ASTM Standards for Fence Materials and Products, latest edition.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Chain Link Fences and Manual Gates:
  - 1. Allied Tube and Conduit Corporation.
  - 2. Anchor Fence, Inc.
  - 3. Cylone Fence/ United States Steel Corporation.
  - 4. Wheatland Tube Company.
  - 5. or equal.

**2.02 MATERIALS**

- A. Chain Link Fabric.
  - 1. Zinc-coated steel in accordance with ASTM A392.
    - a. Class 1.
      - 1) 1.2 oz/sf, minimum average.
- B. Post, Rails, Horizontal Framework and Braces.
  - 1. Shall be Group 1C round steel pipe in accordance with ASTM F1043.
    - a. Minimum Yield Strength = 50,000 psi.
  - 2. Interior and exterior zinc coating shall be one of the following:
    - a. Type A.
      - 1) 1.8 oz/sf, minimum average.
    - b. Type B.
      - 1) 0.9 oz/sf, minimum, interior.
      - 2) 0.9 oz/sf, minimum with a polymer film, exterior.
- C. Tension Wire.
  - 1. Metallic coated steel in accordance with ASTM A824.
    - a. 7 gauge.
    - b. Type 2 (zinc coating).
      - 1) Class 5.

(a) 2 oz/sf, minimum.

D. Fittings.

1. Fittings shall be in accordance with ASTM F626.
  - a. Type of material and protective coating shall match 2.2.B. of this specification.

E. Concrete: Type specified in the Concrete Pavement Specification.

## 2.03 COMPONENTS

A. Chain Link Fabric.

1. 2 inch mesh.
2. 9 gauge.
3. Knuckling selvage at top.
4. Knuckling selvage at bottom.
5. Height of fabric per the plan drawings.

B. Line Post:

1. 1-7/8 inch for 6ft height and less.
2. 2-3/8 inch for greater than 6ft height.

C. Corner and Terminal Posts:

1. 2-3/8 inch for 6ft height and less.
2. 2-7/8 inch for greater than 6ft height.

D. Horizontal Framework Members.

1. 1-5/8 inch, min.

E. Swing Gates.

1. Shall be in accordance with ASTM F900.
2. Frame shall be welded at all corners.
3. Interior bracing shall be the same material as the frame.
4. Frame members, dimensions and weights as per ASTM F900, Table 1.
  - a. 1-7/8 inch diameter.
  - b. Interior Bracing.
    - 1) 1-5/8 inch diameter.
5. Posts shall be in accordance with ASTM F900, Table 2.
  - a. Gate leaf width.
    - 1) Up to and including 6 feet width.
      - (a) 2-7/8 inch diameter, min.
    - 2) Over 6 feet width to 12 feet width.
      - (a) 4 inch diameter, min.
6. Hinges shall allow gate to swing a full 180 degrees.
7. Latches shall be provided with provision for locking.

## PART 3 EXECUTION

### 3.01 INSTALLATION

A. Install framework, fabric, accessories and gates in accordance with ASTM F567 and these specifications.

B. Corner and Terminal Posts.

1. Concrete footings shall be 16 inches diameter and extend 7 feet below finish grade.
2. Set terminal posts at the beginning and end of each continuous length of fence and at abrupt changes in vertical and horizontal alignments.

C. Line Posts.

1. Shall be driven by mechanical means to a depth of 5 feet below finish grade.
2. Protect the post top to prevent distortion.
3. Set plumb.
4. Space at equidistant intervals not exceeding 10 feet.

- D. Corner and Terminal Post Bracing.
  - 1. Provide terminal post bracing.
  - 2. Securely fasten horizontal center brace rail and diagonal truss rod to the terminal post and adjacent line post.
- E. Chain Link Fabric.
  - 1. Secure one end to terminal post and apply sufficient tension to remove all slack before making adjustments to second terminal post.
    - a. Tighten fabric to provide a smooth uniform appearance free from sag.
      - 1) Use tension bars with tension bands at maximum 15 inch intervals.
    - b. Install 2 inches above finish ground level.
    - c. Fasten to line posts at intervals not exceeding 12 inches.
    - d. Fasten to rail and tension wire at intervals not exceeding 18 inches.
- F. Top and Bottoms Rails.
  - 1. Fasten rails to terminal posts and join with sleeves or coupling to allow for expansion and contracting.
- G. Tie Wires, Clips and Hog Rings.
  - 1. Install as per ASTM F567.
- H. Gates.
  - 1. Install true to opening and plumb in a closed position.
  - 2. Fabric to match fence.
  - 3. Width shown on plans measured from one inside face to other inside face of gate posts.

### **3.02 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch.
- B. Maximum Offset From True Position: 1 inch.
- C. Do not infringe on adjacent property lines.

**END OF SECTION**

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**SECTION 33 0111  
SITE DISINFECTION OF WATER SYSTEMS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Disinfection of water lines.

**1.02 SUBMITTALS**

- A. Disinfection report:
  - 1. Type and form of disinfectant used.
  - 2. Date and time of flushing start and completion.
  - 3. Disinfectant residual after flushing in ppm for each outlet tested.
- B. Bacteriological report:
  - 1. Date issued, project name, and testing laboratory name, address, and telephone number.
  - 2. Time and date of water sample collection.
  - 3. Name of person collecting samples.
  - 4. Test locations.
  - 5. Coliform bacteria test results for each outlet tested.

**1.03 QUALITY ASSURANCE**

- A. Testing Firm: Company specializing in testing potable water systems, certified by governing authorities of the State in which the Project is located.

**1.04 REGULATORY REQUIREMENTS**

- A. Conform to the Minnesota Plumbing Code for performing the work of this section.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that piping system has been cleaned, inspected, and pressure tested.
  - 1. Pipe system shall have been flushed with clean, potable water until only potable water appears at the points of outlet.

**3.02 DISINFECTION**

- A. Use method prescribed by the applicable state or local codes, or health authority or water purveyor having jurisdiction, or in the absence of any of these follow AWWA C651.
- B. Provide and attach equipment, including sampling line and/or tap, required to perform the work.
- C. Introduce treatment into piping system.
  - 1. Treatment shall be a water-chlorine solution containing at least 50 parts per million of chlorine.
- D. Maintain disinfectant in system for 24 hours.
- E. After disinfecting, the Contractor shall flush the line with clean, potable water until the chlorine residual in the water coming from the system does not exceed the chlorine residual in the flushing water.
- F. Satisfactory bacteriological testing results of the water in accordance with the EPA Safe Drinking Water Act must be completed by an approved agency before placing the water line in service for consumption as potable water.
  - 1. The procedure shall be repeated if it is shown by bacteriological examination by an approved agency that contamination persists in the system.

**3.03 FIELD QUALITY CONTROL**

- A. Test samples in accordance with AWWA C651.

- B. The Contractor or testing laboratory, in the presence of the Owner's Representative or Representative from the City Utility Department, shall perform the sampling.
  - 1. Sampling shall be performed with due care to prevent contamination using sterile bottles provided by the testing laboratory.

**END OF SECTION**

**SECTION 33 1416  
SITE WATER DISTRIBUTION PIPING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Pipe and fittings for water lines.
- B. Valves.

**1.02 SUBMITTALS**

- A. Product Data: Provide data on pipe materials, pipe fittings, valves and accessories.

**PART 2 PRODUCTS**

**2.01 SITE WATER PIPE**

- A. PVC Pipe: AWWA C900 DR18.
  - 1. Joints: ASTM D3139 compression gasket ring.
  - 2. Fittings shall be one of the following:
    - a. Ductile Iron conforming to AWWA C153.
      - 1) Cement mortar lined on interior conforming to AWWA C104.
      - 2) Bituminous coated on exterior conforming to AWWA C153.
      - 3) Stainless steel bolts.
      - 4) Joints shall meet AWWA C111.
    - b. PVC conforming to AWWA C907.
      - 1) Slip joint meeting the same pipe requirements.
      - 2) Joints: ASTM D3139 compression gasket ring.

**2.02 VALVES**

- A. AWWA C515, iron body, bronze trim, non-rising stem with 2 inch operating nut, single wedge, resilient seat, mechanical joint ends.
  - 1. Shall be one of the following.
    - a. American Flow Control Model 2500.
    - b. Clow Valve Company Model 2638.
    - c. Mueller Company Model 2360.
    - d. or equal.
  - 2. All body bolts shall be stainless steel.
  - 3. Shall be coated inside and outside in accordance with AWWA C550.
  - 4. Manufacturer's name and pressure rating marked on valve body.
- B. Valve Box.
  - 1. Shall be cast or ductile iron in accordance with ASTM A48, Class 30B material specification with a minimum tensile strength of 30,000 psi.
  - 2. Screw type adjustment.
  - 3. 3 piece type.
  - 4. 5-1/2 inch shaft.
  - 5. Cover with the word "WATER" imprinted on top.
  - 6. Shall be Tyler or Star heavy duty box.
  - 7. Shall include a gate valve adaptor as manufactured by Adaptor Inc., or equal.

**2.03 TAPPING SLEEVE**

- A. Shall be stainless steel tapping sleeve with a stainless steel flange.
  - 1. Shall be as manufactured by one of the following.
    - a. Romac Industries, Inc.
    - b. PowerSeal
    - c. or equal.

## 2.04 ACCESSORIES

- A. Tracer Wire for Plastic Water Lines.
  - 1. Conductor insulator shall consist of a high molecular weight-high density blue polyethylene jacket complying with ASTM D1248, 30 volt rating.
  - 2. Direct Bury Operations.
    - a. Shall be Copperhead High Strength Tracer Wire, Part #1230-HS, or equal.
    - b. Direct burial #12 AWG Solid (0.0808 inch diameter).
    - c. 21 percent conductivity copper-clad hard drawn high carbon steel extra strength horizontal directional drill tracer wire.
    - d. 452 lb average tensile break load, minimum.
    - e. 30 mil HDPE insulation thickness, minimum.
- B. Concrete for Thrust Restraints: Concrete type specified in Section 32 13 13.
- C. Polyethylene wrap shall be one of the following.
  - 1. Polyethylene plastic film with minimum thickness of 0.008 inch.
  - 2. Cross woven polyethylene plastic film with minimum thickness of 0.004 inch.
- D. Mechanical Joint Restraint.
  - 1. Shall be ductile iron in accordance with ASTM A536.
  - 2. Shall meet ASTM F1674.
  - 3. Shall be EBAA Iron Inc., or equal.
    - a. Shall be Series 1100 for ductile iron pipe.
    - b. Shall be Series 2000PV for PVC pipe.
  - 4. Stainless steel bolts.

## PART 3 EXECUTION

### 3.01 INSTALLATION

- A. Install work in accordance with State Plumbing Code requirements.
- B. Establish elevations of buried piping to ensure not less than 8 ft of cover.
- C. Install PVC piping to AWWA C605.
- D. Install temporary access fittings, material and equipment necessary to permit flushing, pressure testing and disinfection of the water system performed under this specification and Section 33 13 00.
  - 1. Temporary access fittings, material and equipment shall include, but not limited to, the following.
    - a. Cross connection control device.
    - b. Supply hose.
    - c. Temporary cap or plug.
    - d. Temporary test thrust blocking.
    - e. Control valve(s).
    - f. Sampling faucet.
    - g. Discharge/flushing piping.
- E. Locations of Fittings.
  - 1. Make and record distance ties for all fittings such as bends, tees, and wyes which, when backfilled, are not visible.
    - a. Ties shall be made from surface objects such as building corners, property corners, gate valve boxes, curb stop boxes or hydrants.
    - b. A minimum of two ties shall be made for each fitting.
    - c. Upon completion of project, the ties shall be turned over to the Owner.
- F. Tracer Wire.
  - 1. Install per manufacturer's instructions.
  - 2. Termination shall occur at both ends of new water line.

3. Shall be securely affixed to the top exterior surface of the pipe using PVC pipe tape at 5ft intervals.
  4. Shall be looped around valves, saddles, curb stops and other appurtenances in such a manner that there is no interference with the operation of the appurtenances.
  5. Shall be installed continuous without splices, breaks, or cuts.
  6. Install trace wire within 6 inches above top of pipe; coordinate with Section 31 2318.
- G. Ductile iron pipe and fittings.
1. All ductile iron pipe and fittings shall be wrapped in polyethylene wrap.
- H. Valves.
1. Set valves on solid bearing.
  2. Center and plumb valve box on gate valve adaptor over valve.
    - a. Set box cover flush with finished grade.
    - b. The box of the valve shall be wrapped in polyethylene wrap.
    - c. The box shall be backfilled and thoroughly compacted around the box.
  3. Completely wrap all ductile iron pipe and/or fittings, including the body of the valve and the valve box, with polyethylene wrap as per AWWA C105.
  4. Install work in accordance with State Plumbing Code requirements.

### **3.02 FIELD QUALITY CONTROL**

- A. The pipe shall be completely flushed with clean, potable water until only potable water appears at the points of outlet.
- B. Pressure test per the requirements of the State of Minnesota Plumbing Code.
1. The water line shall be tested and proved tight with the use of air or water not less than the maximum working pressure under which it is to be used.
    - a. If tested with water, the water used for the test shall be obtained from a potable source.
- C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

**END OF SECTION**



Zerr Berg Architects/Gehrtz Construction Services

Printed on Tue May 19, 2026 at 09:58 am CDT

Job #: 26-011 Triumph Lutheran Brethren Church East Campus Renovation  
 2901 20th St S  
 Moorhead, Minnesota 56560

**Specifications Included In Triumph Lutheran Brethren Church East Campus Renovation, Moorhead, MN**

Number	Description	Revision	Issued Date	Received Date	Set
<b>00 - Procurement and Contracting Requirements</b>					
00 0000	Spec Cover Page	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
00 0105	Certifications Page	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
00 0110	Table of Contents	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
00 0150	Bid Packages Scope of Work (SOW)	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
00 1100	Invitation for Bids	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
00 2100	Information to Bidders	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
00 4100	Bid Form	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
00 4325	Substitution Request Form - During Procurement	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
00 5200	Agreement Form	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
00 7200	General Conditions	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
00 7300	Supplementary Conditions	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
<b>01 - General Requirements</b>					
01 1400	Work Restrictions	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
01 2000	Price and Payment Procedures	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
01 2010	Change Order Procedures	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
01 2100	Allowances	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
01 2300	Alternates	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs -



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Job #: 26-011 Triumph Lutheran Brethren Church East Campus Renovation  
 2901 20th St S  
 Moorhead, Minnesota 56560

Number	Description	Revision	Issued Date	Received Date	Set
					Specification 05/15/26
01 2600	Work by Others	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
01 3000	Administrative Requirements	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
01 3030	Worksite Safety	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
01 3216	Project Construction Schedule	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
01 4000	Quality Requirements	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
01 4216	Definitions	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
01 5000	Temporary Facilities and Controls	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
01 6000	Product Requirements	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
01 7000	Execution and Closeout Requirements	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
01 7800	Closeout Submittals	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
<b>02 - Existing Conditions</b>					
02 4100	Demolition	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
02 4113	Site Selective Demolition	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
<b>03 - Concrete</b>					
03 2000	Concrete Reinforcing	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
03 3000	Cast-in-Place Concrete	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
03 3512	Concrete Surface Treatment	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
<b>06 - Wood, Plastics, and Composites</b>					
06 1000	Rough Carpentry	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
06 4100	Millwork	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs -



Zerr Berg Architects/Gehrtz Construction Services

Number	Description	Revision	Issued Date	Received Date	Set
					Specification 05/15/26
<b>07 - Thermal and Moisture Protection</b>					
07 0553	Fire and Smoke Assembly Identification	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
07 8400	Firestopping	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
07 9200	Joint Sealants	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
<b>08 - Openings</b>					
08 1113	Hollow Metal Doors and Frames	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
08 1416	Flush Wood Doors	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
08 8000	Glazing	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
08 8813	Fire-Rated Glazing	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
<b>09 - Finishes</b>					
09 2116	Gypsum Board Assemblies	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
09 3000	Tiling	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
09 5100	Acoustical Ceilings	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
09 6500	Resilient Flooring	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
09 6813	Tile Carpeting	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
09 9123	Interior Painting	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
<b>10 - Specialties</b>					
10 2113.19	Plastic Toilet Compartments	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
10 2600	Wall and Door Protection	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
10 2800	Toilet, Bath, and Laundry Accessories	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26



Zerr Berg Architects/Gehrtz Construction Services

Number	Description	Revision	Issued Date	Received Date	Set
<b>12 - Furnishings</b>					
12 3600	Countertops	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
<b>21 - Fire Suppression</b>					
21 0100	Fire Protection General Requirements	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
21 0150	Fire Protection Materials & Methods	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
21 0500	Common Work Results for Fire Suppression	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
21 0523	General-Duty Valves for Water-Based Fire-Suppression Piping	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
21 0553	Identification for Fire Suppression Piping and Equipment	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
21 0784	Mechanical Firestopping	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
21 1100	Facility Fire-Suppression Water-Service Piping	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
21 1300	Fire-Suppression Sprinkler Systems	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
<b>22 - Plumbing</b>					
22 0060	Plumbing & Piping Demolition	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
22 0100	Plumbing General Requirements	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
22 0150	Plumbing & Piping Materials & Methods	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
22 0523	General-Duty Valves for Plumbing Piping	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
22 0553	Identification for Plumbing Piping and Equipment	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
22 0719	Plumbing Piping Insulation	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
22 0784	Mechanical Firestopping	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
22 1005	Plumbing Piping	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26



Zerr Berg Architects/Gehrtz Construction Services

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Job #: 26-011 Triumph Lutheran Brethren Church East Campus Renovation  
 2901 20th St S  
 Moorhead, Minnesota 56560

Number	Description	Revision	Issued Date	Received Date	Set
22 1006	Plumbing Piping Specialties	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
22 4000	Plumbing Fixtures	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
<b>23 - Heating, Ventilating, and Air Conditioning (HVAC)</b>					
23 0060	Mechanical Demolition	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
23 0100	Mechanical General Requirements	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
23 0150	Mechanical Materials & Methods	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
23 0513	Common Motor Requirements for HVAC Equipment	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
23 0553	Identification for HVAC Piping and Equipment	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
23 0593	Testing, Adjusting, and Balancing for HVAC	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
23 0713	Duct Insulation	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
23 0784	Mechanical Firestopping	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
23 0913	Instruments and Control Elements	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
23 0923	Direct-Digital Control System for HVAC	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
23 3100	HVAC Ducts and Casings	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
23 3300	Air Duct Accessories	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
23 3423	HVAC Power Ventilators and Exhaust Systems	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
23 3600	Air Terminal Units	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
23 3700	Air Outlets and Inlets	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
<b>26 - Electrical</b>					
26 0003	General Electrical Requirements	0	05/15/2026	05/18/2026	26-011 TLBC East Campus



Zerr Berg Architects/Gehrtz Construction Services

Job #: 26-011 Triumph Lutheran Brethren Church East Campus Renovation  
 2901 20th St S  
 Moorhead, Minnesota 56560

Number	Description	Revision	Issued Date	Received Date	Set
					Renovation - Const Docs - Specification 05/15/26
<b>31 - Earthwork</b>					
31 2200	Site Grading	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
31 2317	Site Excavation	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
31 2318	Site Trenching	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
31 2324	Site Fill	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
<b>32 - Exterior Improvements</b>					
32 1123	Site Aggregate Courses	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
32 1216	Site Asphalt Pavement	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
32 1313	Site Concrete Pavement	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
32 3113	Site Chain Link Fences	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
<b>33 - Utilities</b>					
33 0111	Site Disinfection of Water Systems	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26
33 1416	Site Water Distribution Piping	0	05/15/2026	05/18/2026	26-011 TLBC East Campus Renovation - Const Docs - Specification 05/15/26