



HOOKER | DE JONG

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Construction Handbook

**LUCAS METROPOLITAN HOUSING
TASK ORDER 2 - RICHMAR MANOR**

3433 West Alexis Road
Toledo, OH 43623

A/E Project No. 2020.0072

PERMIT REVISIONS
JANUARY 29, 2024

SECTION 00 01 10 - TABLE OF CONTENTS

PROCUREMENT AND CONTRACTING REQUIREMENTS

- 1.01 Division 00 -- Procurement and Contracting Requirements
 - A. 00 01 10 - Table of Contents
 - B. 00 43 25 - Substitution Request Form - During Procurement
 - C. 00 63 25 - Substitution Request Form - During Construction

SPECIFICATIONS

- 2.01 Division 01 -- General Requirements
 - A. 01 10 00 - Summary
 - B. 01 15 00 - Disclaimer For Use of Electronic CAD Files
 - C. 01 25 00 - Substitution Procedures
 - D. 01 30 00 - Administrative Requirements
 - E. 01 32 16 - Construction Progress Schedule
 - F. 01 40 00 - Quality Requirements
 - G. 01 42 16 - Definitions
 - H. 01 45 33 - Code-Required Special Inspections
 - I. 01 50 00 - Temporary Facilities and Controls
 - J. 01 55 00 - Vehicular Access and Parking
 - K. 01 60 00 - Product Requirements
 - L. 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions
 - 1. 01 61 16.01 - Accessory Material VOC Content Certification Form
 - M. 01 70 00 - Execution and Closeout Requirements
 - N. 01 74 19 - Construction Waste Management and Disposal
 - O. 01 78 00 - Closeout Submittals
- 2.02 Division 02 -- Existing Conditions
 - A. For Pavements and Site Improvements, see Division 32
 - B. 02 41 00 - Demolition
- 2.03 Division 03 -- Concrete
 - A. 03 10 00 - Concrete Forming and Accessories
 - B. 03 30 00 - Cast-in-Place Concrete
- 2.04 Division 05 -- Metals
 - A. 05 52 13 - Pipe and Tube Railings
- 2.05 Division 06 -- Wood, Plastics, and Composites
 - A. 06 10 00 - Rough Carpentry
 - B. 06 20 00 - Finish Carpentry
- 2.06 Division 07 -- Thermal and Moisture Protection
 - A. 07 14 00 - Fluid-Applied Waterproofing
 - B. 07 92 00 - Joint Sealants
- 2.07 Division 08 -- Openings
 - A. 08 11 13 - Hollow Metal Doors and Frames
 - B. 08 14 16 - Flush Wood Doors
 - C. 08 16 13 - Fiberglass Doors
 - D. 08 71 00 - Door Hardware
- 2.08 Division 09 -- Finishes

Issuance - PERMIT REVISIONS

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- A. 09 05 61 - Common Work Results for Flooring Preparation
 - B. 09 21 16 - Gypsum Board Assemblies
 - C. 09 65 00 - Resilient Flooring
 - D. 09 91 13 - Exterior Painting
 - E. 09 91 23 - Interior Painting
- 2.09 Division 10 -- Specialties
- A. 10 14 00 - Signage
 - B. 10 28 00 - Toilet, Bath, and Laundry Accessories
- 2.10 Division 11 -- Equipment
- A. 11 30 13 - Residential Appliances
- 2.11 Division 12 -- Furnishings
- A. 12 21 13 - Horizontal Louver Blinds
 - B. 12 21 16 - Vertical Louver Blinds
 - C. 12 35 30 - Residential Casework
 - D. 12 36 00 - Countertops
- 2.12 Division 22 -- Plumbing
- A. 22 05 00 - Common Work Results for Plumbing
 - B. 22 07 19 - Plumbing Piping Insulation
 - C. 22 10 05 - Plumbing Piping
 - D. 22 10 06 - Plumbing Piping Specialties
 - E. 22 40 00 - Plumbing Fixtures
- 2.13 Division 23 -- Heating, Ventilating, and Air-Conditioning (HVAC)
- A. 23 05 00 - Common Work Results for HVAC
 - B. 23 07 13 - Duct Insulation
 - C. 23 31 00 - HVAC Ducts and Casings
 - D. 23 33 00 - Air Duct Accessories
 - E. 23 37 00 - Air Outlets and Inlets
- 2.14 Division 26 -- Electrical
- A. 26 05 00 - Common Work Results for Electrical
 - B. 26 05 19 - Low-Voltage Electrical Power Conductors and Cables
 - C. 26 05 26 - Grounding and Bonding for Electrical Systems
 - D. 26 05 29 - Hangers and Supports for Electrical Systems
 - E. 26 05 33.13 - Conduit for Electrical Systems
 - F. 26 05 33.16 - Boxes for Electrical Systems
 - G. 26 05 53 - Identification for Electrical Systems
 - H. 26 05 73 - Power System Studies
 - I. 26 05 83 - Wiring Connections
 - J. 26 06 50.16 - Lighting Fixture Schedule
 - K. 26 09 23 - Lighting Control Devices
 - L. 26 56 00 - Exterior Lighting

END OF SECTION

SECTION 00 43 25 - SUBSTITUTION REQUEST FORM - DURING PROCUREMENT

(DURING THE BIDDING/NEGOTIATING STAGE)

Project:
Substitution Request Number:
From:
To:
Date:
Project Number:
Re:
Contract For:

Specification Title:
Description:
Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution:
Manufacturer:
Address:
Phone:
Trade Name:
Model No.:

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- A. Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- B. Same warranty will be furnished for proposed substitution as for specified product.
- C. Same maintenance service and source of replacement parts, as applicable, is available.
- D. Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- E. Proposed substitution does not affect dimensions and functional clearances.
- F. Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by:
Signed by:
Firm:
Address:
Telephone:

A/E's REVIEW AND ACTION

- Substitution approved - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
- Substitution approved as noted - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
- Substitution rejected - Use specified materials or revise and resubmit with further detail.
- Substitution Request received too late - Use specified materials.

Signed by: _____ Date: _____

Supporting Data Attached: ___ Drawings ___ Product Data ___ Samples ___ Tests ___ Reports
END OF SECTION

SECTION 00 63 25 - SUBSTITUTION REQUEST FORM - DURING CONSTRUCTION

(AFTER THE BIDDING/NEGOTIATING PHASE)

Project:
Substitution Request Number:
From:
To:
Date:
Project Number:
Project Number:
Re:
Contract For:

Specification Title:	Description:
Section: _____ Page: _____	Article/Paragraph: _____

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 _____

- The Undersigned certifies:
- A. Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
 - B. Same warranty will be furnished for proposed substitution as for specified product.
 - C. Same maintenance service and source of replacement parts, as applicable, is available.
 - D. Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
 - E. Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
 - F. Proposed substitution does not affect dimensions and functional clearances.

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- G. Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- H. 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: List the attachments if any here

A/E's REVIEW AND RECOMMENDATION

- Approve Substitution - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
- Approve Substitution as noted - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
- Reject Substitution - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by: _____ Date: _____

OWNER'S REVIEW AND ACTION

- Substitution approved - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures. Prepare Change Order.
- Substitution approved as noted - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures. Prepare Change Order.
- Substitution rejected - Use specified materials.

Signed by: _____ Date: _____

Additional Comments:

- Contractor Subcontractor Supplier Manufacturer A/E
 Other:

END OF SECTION

SECTION 01 10 00 - SUMMARY

PART 1 GENERAL

1.01 PROJECT

- A. Project Name: Richmar Manor Apartments
- B. Owner's Name: Lucas Metropolitan Housing
- C. Property Manager's Name: Lucas Metropolitan Housing
- C. The Project consists of the renovation of an existing community building and laundry facilities and accessible routes to ensure compliance with Section 504 of the Rehabilitation Act at 3433 West Alexis Road, Sylvania, Ohio.

I. PROJECT OVERVIEW

- A. Replacement of select site walks and drives to public-use areas of the property so as to ensure Section 504 compliance, moderate-level rehabilitation of existing community room, bathrooms and offices in community building, moderate level rehabilitation of existing laundry facilities, and selective replacement of damaged site fencing.

II. EXISTING CONDITIONS

- A. Building Exterior Demolition
 - a. Remove any damaged or non-compliant concrete walks
 - b. Remove existing portion of sidewalk, landings and railings at building entries
 - c. Remove existing building lighting at entries
 - d. Remove exterior entry doors and frames and prepare for new doors and frames
- B. Building Interior Demolition
 - a. Remove existing community building entry doors
 - b. Remove existing community building interior doors
 - c. Remove existing community building bathroom plumbing fixtures
 - d. Remove existing community building bathroom toilet accessories
 - e. Remove existing community building kitchen and bathroom electrical receptacles
 - f. Remove existing community building office electrical receptacles
 - g. Remove existing community building flooring
 - h. Remove existing community building kitchen cabinets
 - i. Remove existing community building kitchen appliances
 - j. Remove existing smoke detectors and prep for new combo smoke detectors/CO detectors
 - k. Remove all community building lighting fixtures and store for re-use
 - l. Remove existing laundry plumbing fixtures
- C. Site Demolition
 - a. Remove deteriorating or non-compliant concrete walks along accessible route
 - b. Remove existing vinyl privacy fence post at west property line
 - c. Inspect and assess condition of 24" high retaining wall along the northern section of parking lot at the west property boundary
 - d. Remove top courses of existing concrete masonry units at basement entry at rear of retail building
 - e. Remove existing metal basement entry door at rear of retail building.

- f. Remove existing basement windows at rear of retail building
- g. Remove existing tree and plantings at south side of Laundry Room 2 to allow for new sidewalk

III. NEW CONSTRUCTION

- A. Concrete
 - a. Site concrete – selectively locate new concrete sidewalks to provide for an accessible route
 - b. Provide new concrete ramps and landings to entry doors along accessible routes
- B. Masonry
 - a. CMU infill at basement window locations
- C. Metals
 - a. Provide new steel pipe handrails at new accessible entry ramp locations
 - b. Provide new steel guardrail at west property line
- D. Thermal and Moisture Protection
 - a. Seal all exterior wall penetrations
 - b. Caulk wall/floor transition
 - c. Seal around electrical devices on exterior walls
- E. Openings
 - a. Install new Community Building entrance doors and hardware
 - b. Install new laundry entrance door and hardware
 - c. Install new Community Building interior doors and hardware
- F. Finishes
 - a. Patch and repair existing walls and ceilings where needed
 - b. Install new LVT flooring in Community Building
 - c. Install new LVT flooring in Laundry Rooms
 - d. Paint all spaces of the community building and laundry interiors – walls, ceilings, doors, trim, shelves
- G. Specialties
 - a. New toilet room accessories (Toilet paper holders, mirrors)
 - b. New building signage
- H. Equipment
 - a. Appliances – provide new warming oven, microwave, refrigerator
- I. Furnishings
 - a. New HUD Severe Use Certified kitchen base and wall cabinets
 - b. New kitchen countertops
 - c. New tilt-up folding counter in Laundry Room and Community Room Kitchen
 - d. Window treatments (vertical and horizontal blinds)
- J. Plumbing
 - a. Community Building
 - i. Jet cleaning of existing sanitary system

- ii. Kitchen Sink (KS-1A)
 - 1. Drop in sink
 - 2. Double bowl, stainless steel, 4 faucet holes, 6-1/2" maximum depth
 - 3. Rear Center drain
 - 4. ADA/ANSI A117.1 compliant
 - 5. Basis of Design: Dayton model GE23322
 - 6. Single lever Faucet
 - a. ADA/ANSI A117.1 Compliant
 - b. Side sprayer
 - c. Maximum 1.5 gpm
 - d. Basis of Design: Wolverine Brass model 85601 with aerator
- iii. Lavatory (LAV-2A)
 - 1. Wall hung sink
 - 2. ADA/ANSI A117.1 compliant
 - 3. Basis of Design: American Standard 0355.012
 - 4. Install new angle stops
 - 5. Concealed arm wall carrier
 - a. Basis of design: Zurn model Z1231
 - 6. Single lever Faucet
 - a. ADA / ANSI A117.1 Compliant
 - b. 0.5 gpm, Watersense Certified
 - c. Basis of Design: Wolverine Brass model 85260 with aerator
- iv. Water Closet Accessible (WC-1A)
 - 1. 1000g MaP Score @1.0 GPF, Watersense Certified.
 - 2. 16-1/2" rim height, ADA/ANSI A117.1 compliant
 - 3. Floor mounted
 - 4. Tank type
 - 5. Install angle stops
 - 6. Basis of Design: Kohler model Highline Pressure Lite K-3519
- v. Electric Water Cooler
 - 1. Bi-level, with bottle filler
 - 2. ANSI A117.1 compliant
 - 3. Basis of design: Elkay model EZSTL8WSLK
- vi. Domestic Water Heater (DWH-1)
 - 1. Gas Heat
 - 2. Tank type
 - 3. 40 Gallons
 - 4. First Hour Rating: 88 Gallons
 - 5. Basis of Design: Rheem Pro+G40 – 50U RH HE ECL

K. Heating Ventilation and Air Conditioning (See System Schematic)

a. Community Building:

- i. Unit Cooling / Heating System
 - 1. Re-work existing sheet metal duct work to route to new bathroom and kitchen locations as necessary
- ii. Furnish and install bathroom exhaust fan (EF-1)
 - 1. Energy Star certified
 - 2. 70 CFM minimum airflow
 - 3. Combination exhaust fan with light
 - 4. Route exhaust air hard duct to exterior wall with wall cap.
 - 5. Install radiation damper at rated assemblies
 - 6. Controls: to operate with light switch
 - 7. Basis of design: Broan XB80L1 Series

- iii. Install ceiling mounted supply grilles (SG-X)
 - 1. Install radiation damper at rated assemblies
 - 2. Adjustable deflection blades
 - 3. Basis of Design: Price 500 series
 - iv. Install wall mounted return grilles (RG-X)
 - 1. 45-degree deflection blades
 - 2. 3/4" blade spacing
 - 3. Basis of Design: Price 530 series
- L. Electrical System:
- a. Existing distribution system to remain.
 - b. Wiring devices will be commercial specification grade in public and commons areas. Tamper proof receptacles will be installed in common areas as per code. GFCI receptacles will be installed in kitchens, at sinks, at special equipment and outdoors. AFCI circuit breakers or receptacles will be installed as required by code.
- M. Lighting System:
- a. All lighting will be high efficiency LED fixtures with color temperature of 3000-4000 Deg K.
 - b. Exit and emergency fixtures will be self-testing, energy efficient, long-life, LED with internal 90 minute battery backup.
 - c. Lighting levels will be in accordance with Federal, State, Local Codes, and IES standards.
 - d. Exterior building, walk, drive and parking lot lighting will consist of sharp cut-off type, LED fixtures, which comply with 'Dark-Sky' laws and light trespass requirements, Exterior lighting will be controlled via combination of dusk-to-dawn and programmed on/off functions.
 - e. Common area lighting will consist of re-use of existing interior fixtures, etc. Utility type lighting fixtures in mechanical and storage areas. Local room dimming functions will be provided in selected rooms such as conference rooms, etc. Interior lighting control will be a combination of local switching and occupancy/vacancy sensors.
- N. Fire Alarm:
- a. Replace existing smoke alarms with new photoelectric smoke alarms or CO combination units that are both hardwired, interconnected and with long-life battery backup.
- O. Exterior Improvements
- a. Installation of pre-manufactured wave-style bicycle rack for five bicycles at the front of the leasing office.
 - b. Site excavation and preparation for new sidewalks and building entry pads
 - c. Removal of existing tree and plantings at the south face of Laundry Room 2 to allow for installation of new concrete sidewalks
- P. Utilities
- a. Existing utilities to include Natural Gas, Domestic water and sanitary.
 - b. Relocate existing gas meters at south wall of Laundry Room 2 to allow for new entry concrete pad.

SECTION 01 15 00 - DISCLAIMER FOR USE OF ELECTRONIC CAD FILES

SUMMARY

1.01 See Disclaimer For Use of Electronic CAD Files following this document.

END OF DISCLAIMER FOR USE OF ELECTRONIC CAD FILES

ELECTRONIC MEDIA REQUEST FORM
(for use of electronic information/data)



DISCLAIMER FOR USE OF ELECTRONIC CAD FILES

At your request, we will provide electronic files for your convenience and use in the preparation of shop drawings (or other approved uses) for the referenced project, subject to the following terms and conditions:

We make no representation as to the compatibility of these files with your hardware or your software.

Data contained on these electronic files are part of our instruments of service, are copyrighted and shall not be used for any purpose other than as a convenience in the preparation of shop drawings (or other approved uses) for the referenced project only. Any other use will be at your sole risk and without liability or legal exposure to us. You agree to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against us, our officers, directors, employees, agents or sub consultants that may arise out of or in connection with your use of the electronic files. Files being sent are for your exclusive use and you agree not to transmit them to any one else without prior permission and re-submittal of this agreement.

Furthermore, you shall, to the fullest extent permitted by law, indemnify and hold us harmless against all damages, liabilities or costs, including reasonable attorneys' fees and defense costs, arising out of or resulting from your use of these electronic files.

These electronic files are not construction documents. Differences may exist between these electronic files and corresponding hard-copy construction documents. We make no representation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the signed or sealed hard-copy construction documents prepared by us and the electronic files, the signed or sealed hard-copy construction documents shall govern. You are responsible for determining if any conflict exists. By your use of these electronic files, you are not relieved of your duty to fully comply with the contract documents, including, and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other contractors for the project.

Because information presented on the electronic files can be modified, unintentionally or otherwise, we reserve the right to remove all indication of ownership and/or involvement from each electronic display.

Under no circumstances shall delivery of the electronic files for use by you be deemed a sale by us, and we make no warranties, either express or implied, of merchantability and fitness for any particular purpose. In no event shall we be liable for any loss of profit or any consequential damages as a result of your use or reuse of these electronic files.

"As-Built" Cad Drawings have been generated using information submitted to HOOKER | DE JONG by the Construction Manager. The information and update of the construction documents is based on marked-up drawings of the contractors' addendums, bulletins, change orders and field directives which may or may not have been verified by HOOKER | DE JONG.

Unless you reply to the contrary within 3 business days from the time the file(s) have been sent from HOOKER | DE JONG to you, you agree to the contents of this notice and that you have successfully received and opened the files requested. We may not hold translated versions of our files longer than 3 business days.



ELECTRONIC MEDIA REQUEST FORM
(for use of electronic information/data)



PROJECT NAME: _____

HOOKER | DE JONG Project# _____

(HOOKER | DE JONG Project # and drawing Number are located in the lower right hand corner of the drawing title block)

DOCUMENTS REQUESTED (Drawing Number): _____ **ISSUE DATE:** _____

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Purpose for Request: _____

UNDERSIGNED:

Signature: _____ Date: _____

Printed Name: _____ Title: _____

Company: _____

Address: _____

City, State ZIP: _____

APPROVED BY:

Signature: _____ Date: _____

Printed Name: _____ Total Cost: \$ _____

Payment for files should be received prior to their release (or facsimile of completed check).



SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedural requirements for proposed substitutions.

1.02 RELATED REQUIREMENTS

- A. Section 00 63 25 - Substitution Request Form - During Construction: Required form for substitution requests made after award of contract (During construction).
- B. Section 01 30 00 - Administrative Requirements: Submittal procedures, coordination.
- C. Section 01 60 00 - Product Requirements: Fundamental product requirements, product options, delivery, storage, and handling.
- D. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Restrictions on emissions of indoor substitute products.

1.03 DEFINITIONS

- A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
 - 1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
 - a. Unavailability.
 - b. Regulatory changes.
 - 2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
 - a. Substitution requests offering advantages solely to the Contractor will not be considered.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 - 2. Agrees to provide the same warranty for the substitution as for the specified product.
 - 3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
 - 4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
 - 5. Waives claims for additional costs or time extension that may subsequently become apparent.
 - 6. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
- B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
 - 1. Note explicitly any non-compliant characteristics.
- C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
 - 1. Forms included in the Project Manual are adequate for this purpose, and must be used.

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

3.02 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

- A. Submittal Form (after award of contract):
 - 1. Submit substitution requests by completing the form in Section 00 63 25; see this section for additional information and instructions. Use only this form; other forms of submission are unacceptable.
- B. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
- C. Submit request for Substitution for Convenience immediately upon discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
 - 1. In addition to meeting general documentation requirements, document how the requested substitution benefits the Owner through cost savings, time savings, greater energy conservation, or in other specific ways.
 - 2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
 - 3. Bear the costs engendered by proposed substitution of:
 - a. Owner's compensation to the Architect for any required redesign, time spent processing and evaluating the request.
 - b. Other construction by Owner.
 - c. Other unanticipated project considerations.
- D. Substitutions will not be considered under one or more of the following circumstances:
 - 1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
 - 2. Without a separate written request.

3.03 RESOLUTION

- A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.
- B. Architect will notify Contractor in writing of decision to accept or reject request.
 - 1. Architect's decision following review of proposed substitution will be noted on the submitted form.

3.04 ACCEPTANCE

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

3.05 CLOSEOUT ACTIVITIES

- A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.
- B. Include completed Substitution Request Forms as part of the Project record. Include both approved and rejected Requests.

END OF SECTION

SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General administrative requirements.
- B. Preconstruction meeting.
- C. Progress meetings.
- D. Construction progress schedule.
- E. Submittals for review, information, and project closeout.
- F. Number of copies of submittals.
- G. Requests for Information (RFI) procedures.
- H. Submittal procedures.

1.02 RELATED REQUIREMENTS

- A. Section 01 60 00 - Product Requirements: General product requirements.
- B. Section 01 70 00 - Execution and Closeout Requirements: Additional coordination requirements.

1.03 GENERAL ADMINISTRATIVE REQUIREMENTS

- A. Comply with requirements of Section 01 70 00 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.
- B. Make the following types of submittals to Architect:
 - 1. Requests for Information (RFI).
 - 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.

1.04 PROJECT COORDINATOR

- A. Project Coordinator: General Contractor.
- B. During construction, coordinate use of site and facilities through the Project Coordinator.
- C. 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.
- D. 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 10 00 - Summary.
- E. Coordinate field engineering and layout work under instructions of the Project Coordinator.
- F. 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 PRECONSTRUCTION MEETING

- A. Project Coordinator will schedule a meeting after Notice of Award.
- B. Attendance Required:
 1. Owner.
 2. Architect.
 3. Contractor.
- 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. Submission of initial Submittal schedule.
 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 7. Scheduling.
- D. Record minutes and distribute copies within five days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.02 PROGRESS MEETINGS

- A. General Contractor will schedule and administer meetings throughout progress of the Work at maximum monthly intervals.
- B. General Contractor will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required: General contractor Job superintendent, Owner, Architect, as appropriate to agenda topics for each meeting.
 1. Contractor.
 2. Owner.
 3. Architect.
 4. Special 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. Maintenance of progress schedule.

8. Corrective measures to regain projected schedules.
 9. Planned progress during succeeding work period.
 10. Coordination of projected progress.
 11. Maintenance of quality and work standards.
 12. Effect of proposed changes on progress schedule and coordination.
 13. Other business relating to work.
- E. Record minutes and distribute copies within five days after meeting to participants, with one copy to Architect, Owner, participants, and those affected by decisions made.
- 3.03 CONSTRUCTION PROGRESS SCHEDULE - See Section 01 32 16
- A. Within 10 days after date of the 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 10 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.
- 3.04 COORDINATION DRAWINGS
- A. Provide information required by Project Coordinator for preparation of coordination drawings.
 - B. Review drawings prior to submission to Architect.
- 3.05 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. 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 60 00 - 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.
 4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
 - a. The Owner reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Architect, and any of its consultants, due to processing of such RFIs.
- 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. Owner's, Architect's, and Contractor's names.
 3. Discrete and consecutive RFI number, and descriptive subject/title.
 4. Issue date, and requested reply date.
 5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
 6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
 7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
- F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
- G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
1. Indicate current status of every RFI. Update log promptly and on a regular basis.
 2. Note dates of when each request is made, and when a response is received.
 3. Highlight items requiring priority or expedited response.
 4. Highlight items for which a timely response has not been received to date.
 5. Identify and include improper or frivolous RFIs.
- H. Review Time: Architect will respond and return RFIs to Contractor within 5 working days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.
- I. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and

follow up with an appropriate Change Order request to Owner.

1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
4. Notify Architect within 5 working days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.06 SUBMITTAL SCHEDULE

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

3.07 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 78 00 - Closeout Submittals.

3.08 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.

3.09 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 78 00 - Closeout Submittals:
 - 1. Project record documents.
 - 2. Operation and maintenance data.
 - 3. Warranties.
 - 4. Bonds.
 - 5. Other types as indicated.

3.10 NUMBER OF COPIES OF SUBMITTALS

- A. Documents: Submit one electronic copy in Portable Document Format (PDF) format; an electronically-marked up file will be returned. Ensure all securities are turned off. Create PDFs at native size and right-side up; Do not mix original sizes, send as Separate PDF files. Illegible files will be rejected. Maximum file size for each submittal is 7 MB.
- B. Extra Copies at Project Closeout: See Section 01 78 00.
- C. Provide original's of all color samples for review.
- D. 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.

3.11 SUBMITTAL PROCEDURES

- A. General Requirements:
 - 1. Use a separate transmittal for each item.
 - 2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
 - 3. Transmit using approved form.
 - a. Use Contractor's form, subject to prior approval by Architect.
 - 4. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
 - 5. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
 - 6. 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.
 - 7. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
 - a. Send submittals in electronic format via email to Architect.
 - 8. Schedule submittals to expedite the Project, and coordinate submission of related items.
 - a. For each submittal for review, allow 10 working 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 5 working days.
 - 9. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.

10. Provide space for Contractor and Architect review stamps.
 11. When revised for resubmission, identify all changes made since previous submission.
 12. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
 13. 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.
 14. Submittals not requested will be recognized, and will be returned "Not Reviewed",
- 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. Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which 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. Informational submittals upon which the Architect is 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 Architect without action.
- F. The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.
- G. By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner 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.
- H. 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 approved by the Architect.
- I. The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing 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.

- J. 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 Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions.
- K. Each submittal is to be compiled into one PDF with all the required information per the submittals sections of each specifications section.
- L. Each electronic submittal shall be named as follows: The specification section number - One digit sequential number, The revision number beginning with zero and then the specification name and submittal type.
Example: 07 42 14-1 Rev 0 INSULATED METAL PANELS - PRODUCT DATA.
- M. For specifications sections that have multiple submittals requested increase the one digit sequential number by one.
Example: 07 42 14-2 Rev 0 INSULATED METAL PANELS - PRODUCT DATA.
- N. For submittals that have to be resubmitted increase the revision number by one.
Example 07 42 14-1 Rev 1 INSULATED METAL PANELS - PRODUCT DATA.
- O. The submittal type is to be either product data, shop drawing, or samples.
- P. Transmit each submittal with a Contractors transmittal form in a merged PDF file with the submittal.
- Q. Transmit each transmittal and submittal electronically via email to submittals@hdjinc.com and kevink@hdjinc.com.
- R. Provide the following in the subject line of the email : Task Order 2 - Richmar Manor 2020.0072 Submittals for Review
- S. In the body of the email list the submittal for review. Use the naming convention listed above for the submittal.
- T. Provide a submittal schedule for the requested submittals listed in each specification section or on drawings.

END OF SECTION

SECTION 01 32 16 - CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preliminary schedule.
- B. Construction progress schedule, bar chart type.

1.02 RELATED SECTIONS

- A. Section 01 10 00 - Summary: Work sequence.

1.03 REFERENCE STANDARDS

- A. AGC (CPSM) - Construction Planning and Scheduling Manual; 2004.
- B. M-H (CPM) - CPM in Construction Management - Project Management with CPM; 2015.

1.04 SUBMITTALS

- A. Within 10 days after date of Agreement, submit preliminary schedule.
- 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.
- D. Submit updated schedule with each Application for Payment.

1.05 QUALITY ASSURANCE

- A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with one years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.

1.06 SCHEDULE FORMAT

- A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.
- B. Sheet Size: Multiples of 8-1/2 x 11 inches.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE

- A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 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. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- D. Coordinate content with schedule of values specified in Section 01 20 00 - Price and Payment Procedures.
- E. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS

- A. Include a separate bar for each major portion of Work or operation.
- B. Identify the first work day of each week.

3.04 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.

3.05 DISTRIBUTION OF SCHEDULE

- A. Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Architect, Owner, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

END OF SECTION

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Submittals.
- B. Quality assurance.
- C. Control of installation.
- D. Defect Assessment.

1.02 RELATED REQUIREMENTS

- A. Section 01 30 00 - Administrative Requirements: Submittal procedures.
- B. Section 01 42 16 - Definitions.

1.03 REFERENCE STANDARDS

- A. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation; 2017.
- B. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2021.

1.04 DEFINITIONS

- A. Contractor's Quality Control Plan: Contractor's management plan for executing the Contract for Construction.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. 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.

PART 3 EXECUTION

2.01 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.

2.02 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not complying with specified requirements.

END OF SECTION

SECTION 01 42 16 - DEFINITIONS

PART 1 GENERAL

1.01 SUMMARY

- A. 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. Provide: To furnish and install.
- E. Supply: Same as Furnish.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Temporary utilities.
- B. Temporary sanitary facilities.
- C. Temporary Controls: Barriers, enclosures, and fencing.
- D. Security requirements.
- E. Vehicular access and parking.
- F. Waste removal facilities and services.
- G. Project identification sign.
- H. Field offices.

1.02 RELATED REQUIREMENTS

- A. Section 01 51 00 - Temporary Utilities.
- B. Section 01 52 13 - Field Offices and Sheds.
- C. Section 01 55 00 - Vehicular Access and Parking.

1.03 TEMPORARY UTILITIES - See Section 01 51 00

1.04 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Maintain daily in clean and sanitary condition.

1.05 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.06 FENCING

- A. Construction: to be coordinated with Owner.

1.07 INTERIOR ENCLOSURES

- A. Provide temporary partitions and ceilings 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 - See Section 01 35 53

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

1.09 VEHICULAR ACCESS AND PARKING - See Section 01 55 00

- 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. Contractor parking to be coordinated with Owner.

1.10 WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site periodically.
- C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
- D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.11 PROJECT IDENTIFICATION

- A. Provide project identification sign of design, construction, and location approved by Owner.
- B. No other signs are allowed without Owner permission except those required by law.

1.12 FIELD OFFICES - See Section 01 52 13

- A. To be coordinated with Owner.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 55 00 - VEHICULAR ACCESS AND PARKING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Parking.
- B. Existing pavements and parking areas.
- C. Permanent pavements and parking facilities.
- D. Construction parking controls.
- E. Maintenance.
- F. Removal, repair.

1.02 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary: For access to site, work sequence, and occupancy.
- B. Section 01 58 13 - Temporary Project Signage: Post Mounted and Wall Mounted Traffic Control and Informational Signs.

PART 3 EXECUTION

2.01 PREPARATION

2.02 PARKING

- A. Arrange for temporary parking areas to accommodate use of construction personnel.
- B. Locate as approved by Owner.

2.03 Permanent pavements and parking facilities

- A. Avoid traffic loading beyond paving design capacity. Tracked vehicles not allowed.

2.04 CONSTRUCTION PARKING CONTROL

- A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and Owner's operations.

2.05 MAINTENANCE

- A. Maintain traffic and parking areas in a sound condition free of excavated material, construction equipment, products, mud, snow, and ice.
- B. Maintain existing paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

2.06 REMOVAL, REPAIR

- A. Repair existing facilities damaged by use, to original condition.
- B. Repair damage caused by installation.

END OF SECTION

SECTION 01 60 00 - 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. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary: Lists of products to be removed from existing building.
- B. Section 01 25 00 - Substitution Procedures: Substitutions made during procurement and/or construction phases.
- C. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.
- D. Section 01 74 19 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

1.03 SUBMITTALS

- A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
 - 1. Submit within 15 days after date of Notice to Proceed.
 - 2. For products specified only by reference standards, list applicable reference standards.
- B. 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.
- C. 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.
- D. 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.
- D. Specific Products to be Reused: The reuse of certain materials and equipment already existing on the project site is required.
 - 1. See Section 01 10 00 for list of items required to be salvaged for reuse and relocation.

2. If reuse of other existing materials or equipment is desired, submit substitution request.

2.02 NEW PRODUCTS

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

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. See Section 01 25 00 - Substitution Procedures.

3.02 TRANSPORTATION AND HANDLING

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 74 19.
- 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. Provide off-site storage and protection when site does not permit on-site storage or protection.
- G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- H. Comply with manufacturer's warranty conditions, if any.
- I. Do not store products directly on the ground.

- J. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- K. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- L. Prevent contact with material that may cause corrosion, discoloration, or staining.
- M. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- N. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 61 16 - VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

1.02 RELATED REQUIREMENTS

- A. Section 01 30 00 - Administrative Requirements: Submittal procedures.

1.03 DEFINITIONS

- A. Interior of Building: Anywhere inside the exterior weather barrier.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: For each VOC-restricted product used in the project, submit evidence of compliance.

PART 2 PRODUCTS

2.01 MATERIALS

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
- B. Additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION

SECTION 01 61 16.01 - ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

FORM

1.01 Identification:

- A. Project Name: _____
- B. Project No.: _____
- C. Architect: _____

1.02 Use of This Form:

- A. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
- B. Contractor is required to obtain and submit this form from each installer of work on this project.
- C. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
- D. If any of these accessory materials has been used, attach to this form product data and MSDS sheet for each such product.

1.03 VOC content restrictions are specified in Section 01 61 16.

2.01 PRODUCT CERTIFICATION

- A. I certify that the installation work of my firm on this project:
 - 1. [HAS] [HAS NOT] required the use of any ADHESIVES.
 - 2. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
 - 3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
 - 4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.
- B. Product data and MSDS sheets are attached.

3.01 CERTIFIED BY: (Installer/Manufacturer/Supplier Firm)

- A. Firm Name: _____
- B. Print Name: _____
- C. Signature: _____
- D. Title: _____ (officer of company)
- E. Date: _____

END OF SECTION

SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition.
- C. Cutting and patching.
- D. Surveying for laying out the work.
- E. Cleaning and protection.
- F. Starting of systems and equipment.
- G. Demonstration and instruction of Owner personnel.
- H. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
- I. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
- B. Section 01 30 00 - Administrative Requirements: Submittals procedures, Electronic document submittal service.
- C. Section 01 40 00 - Quality Requirements: Testing and inspection procedures.
- D. Section 01 50 00 - Temporary Facilities and Controls: Temporary exterior enclosures.
- E. Section 01 50 00 - Temporary Facilities and Controls: Temporary interior partitions.
- F. Section 01 74 19 - Construction Waste Management and Disposal: Additional procedures for trash/waste removal, recycling, salvage, and reuse.
- G. Section 01 78 00 - Closeout Submittals: Project record documents, operation and maintenance data, warranties, and bonds.
- H. Section 02 41 00 - Demolition: Demolition of whole structures and parts thereof; site utility demolition.
- I. Section 07 84 00 - Firestopping.
- J. Individual Product Specification Sections:
 - 1. Advance notification to other sections of openings required in work of those sections.
 - 2. Limitations on cutting structural members.

1.03 REFERENCE STANDARDS

- A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.04 SUBMITTALS

- A. See Section 01 30 00 - 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.
6. Include in request:
 - a. Identification of Project.
 - b. Location and description of affected work.
 - c. Necessity for cutting or alteration.
 - d. Description of proposed work and products to be used.
 - e. Alternatives to cutting and patching.
 - f. Effect on work of Owner or separate Contractor.
 - g. Written permission of affected separate Contractor.
 - h. Date and time work will be executed.

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

1.05 QUALIFICATIONS

- A. For demolition work, employ a firm specializing in the type of work required.
- B. 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,
- C. 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.
- D. 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.

1.07 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 60 00 - 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 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.

3.04 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.

3.05 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 50 00 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.
 - 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.
- 3.06 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 original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- G. Restore work with new products in accordance with requirements of Contract Documents.
- H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, 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.

3.07 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.08 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.09 SYSTEM STARTUP

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- D. Verify that wiring and support components for equipment are complete and tested.
- E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- F. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.10 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.
- B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- C. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner's personnel.

3.11 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.
- B. Testing, adjusting, and balancing HVAC systems: See Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC.

3.12 FINAL CLEANING

- A. Use cleaning materials that are nonhazardous.
- B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- E. Clean filters of operating equipment.
- F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.
- G. Clean site; sweep paved areas, rake clean landscaped surfaces.
- H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.13 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.

3.14 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 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

- A. Owner requires that this project generate the least amount of trash and waste possible.
- B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
- C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
- D. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, incineration, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.
- E. Methods of trash/waste disposal that are not acceptable are:
 - 1. Burning on the project site.
 - 2. Burying on the project site.
 - 3. Dumping or burying on other property, public or private.
 - 4. Other illegal dumping or burying.
- F. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 DEFINITIONS

- A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
- B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.
- C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.
- D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
- E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
- F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.
- H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- I. Return: To give back reusable items or unused products to vendors for credit.
- J. Reuse: To reuse a construction waste material in some manner on the project site.
- K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
- M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

- O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
 - 1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
 - 2. Submit Report on a form acceptable to Owner.
 - 3. Landfill Disposal: Include the following information:
 - a. Identification of material.
 - b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
 - c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - 4. Incinerator Disposal: Include the following information:
 - a. Identification of material.
 - b. Amount, in tons or cubic yards, of trash/waste material from the project delivered to incinerators.
 - c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - 5. Recycled and Salvaged Materials: Include the following information for each:
 - a. Identification of material, including those retrieved by installer for use on other projects.
 - b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.
 - c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
 - 6. Material Reused on Project: Include the following information for each:
 - a. Identification of material and how it was used in the project.
 - b. Amount, in tons or cubic yards.
 - c. Include weight tickets as evidence of quantity.
 - 7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

- A. See Section 01 30 00 for additional requirements for project meetings, reports, submittal procedures, and project documentation.
- B. See Section 01 50 00 for additional requirements related to trash/waste collection and removal facilities and services.
- C. See Section 01 60 00 for waste prevention requirements related to delivery, storage, and handling.
- D. See Section 01 70 00 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

- A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.
- B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.
- C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.
- D. Meetings: Discuss trash/waste management goals and issues at project meetings.
 - 1. Prebid meeting.
 - 2. Preconstruction meeting.
 - 3. Regular job-site meetings.
- E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
 - 1. Provide containers as required.
 - 2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
 - 3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
- F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
- G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.
- H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.
- I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

SECTION 01 78 00 - 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 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- B. Section 01 70 00 - Execution and Closeout Requirements: Contract closeout procedures.
- C. Individual Product Sections: Specific requirements for operation and maintenance data.
- D. 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. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
 - 2. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
 - 3. Submit two sets of revised final documents in final form within 10 days after final inspection.
- 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. Field changes of dimension and detail.
 - 2. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

- A. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- B. 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.
- C. 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. 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. 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.

3.05 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.

END OF SECTION

SECTION 02 41 00 - DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Selective demolition of built site elements.
- B. Selective demolition of building elements for alteration purposes.

1.02 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary: Limitations on Contractor's use of site and premises.
- B. Section 01 10 00 - Summary: Description of items to be salvaged or removed for re-use by Contractor.
- C. Section 01 50 00 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
- D. Section 01 60 00 - Product Requirements: Handling and storage of items removed for salvage and relocation.
- E. Section 01 70 00 - 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.
- F. Section 31 23 23 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

1.03 REFERENCE STANDARDS

- A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.
- B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Site Plan: Showing:
 - 1. Areas for temporary construction and field offices.
- C. Project Record Documents (digital photographs with time and date stamped on image): Show existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by building demolition operations. Submit before work begins.

1.05 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Company specializing in the type of work required.
 - 1. Minimum of 3 years of documented experience.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Fill Material: As specified in Section 31 23 23 - Fill.

PART 3 EXECUTION

3.01 SCOPE

- A. Remove paving and curbs as required to accomplish new work.
- B. Remove concrete slabs on grade within site boundaries.
- C. Remove other items indicated, for salvage, relocation, and recycling.
- D. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 31 22 00.

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 permit.
 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. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.
- E. Protect existing structures and other elements that are not to be removed. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
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.
- F. 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.
- G. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.
- H. 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.
- I. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.
- J. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety.
- K. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner. Use materials identical to existing materials, and use materials that visually match existing adjacent surfaces.
- L. Patch components in a manner that provides a watertight / weathertight condition.

3.03 EXISTING UTILITIES

- A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 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 utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.04 SELECTIVE DEMOLITION FOR 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 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 other areas that are still occupied.
 - 1. Provide, erect, and maintain temporary dustproof partitions of construction indicated on drawings 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.
- D. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove items indicated on drawings.
- E. 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 that are to remain in operation; 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.
- 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.

4. Patch as specified for patching 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.

3.06 CUTTING AND PATCHING

- A. Contractor shall be responsible for all cutting, fitting, or patching that may be required to complete the work or to make components fit together properly. Cut existing construction to provide for installation of components or to perform other construction, and patch as required matching surfaces to their original condition.
- B. Contractor shall not damage any portion of the work by cutting, patching, or modifying any work, or by excavation.
 1. Contractor shall not cut or make alterations to the work without the written consent of the Construction Manager / Architect.
 2. Contractor shall not withhold from the Construction Manager / Architect or any separate contractor his consent to cutting or otherwise altering the work.
- C. Prior to Commencing work, examine surfaces to be cut and patches, and conditions under which cutting and patching are to be performed.
 1. Prior to patching, verify compatibility of existing finishes or primers
 2. Proceed with work after unsafe or unacceptable conditions have been corrected.
- D. Provide temporary support of work to be cut. Protect existing construction during cutting and patching to prevent damage. Provide protection of work from adverse weather conditions that might be exposed during cutting and patching operations.
- E. Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original installer's written recommendations.
 1. In general, use hand or small power tools designed for sawing and grinding, not hammering or chopping. Cut holes and slots as small as possible, neatly to size required and with minimum disturbance to adjacent surfaces. Temporarily cover openings when not in use.
 2. Existing Finished Surfaces: Cut or drill from exposed or finished side into concealed surfaces.
 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
 5. Mechanical and Electrical Service: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
- F. Proceed with patching after construction operations requiring cutting are complete.
- G. Patch construction by filling, repairing, refinishing, closing up, and similar operations following other work. Patch with durable seams that are as invisible as possible.

3.07 DISPOSAL OF DEMOLISHED MATERIAL

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on site.
2. Remove and transport debris in a manner that will prevent spillage of adjacent surfaces or areas.

3.08 Burning: Do not burn demolished materials.

3.09 Disposal: Transport demolished materials off Owner's property and legally dispose of them.

END OF SECTION

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete formwork.
- B. Floors and slabs on grade.
- C. Concrete reinforcement.
- D. Joint devices associated with concrete work.
- E. Miscellaneous concrete elements, including equipment pads, equipment pits, light pole bases, flagpole bases, and thrust blocks.
- F. Concrete curing.

1.02 RELATED REQUIREMENTS

- A. Section 06 05 73 - Wood Treatment: Field-applied termiticide and mildicide for concrete surfaces.
- B. Section 07 92 00 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.
- C. Section 31 31 16 - Termite Control: Field-applied termiticide and mildewcide for concrete surfaces.

1.03 REFERENCE STANDARDS

- A. ACI 117 - Specification for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).
- B. ACI 211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide; 2022.
- C. ACI 301 - Specifications for Concrete Construction; 2020.
- D. ACI 302.1R - Guide to Concrete Floor and Slab Construction; 2015.
- E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).
- F. ACI 305R - Guide to Hot Weather Concreting; 2020.
- G. ACI 306R - Guide to Cold Weather Concreting; 2016.
- H. ACI 308R - Guide to External Curing of Concrete; 2016.
- I. ACI 318 - Building Code Requirements for Structural Concrete; 2019 (Reapproved 2022).
- J. ACI 347R - Guide to Formwork for Concrete; 2014 (Reapproved 2021).
- K. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.
- L. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.
- M. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2018.
- N. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2013.
- O. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2023.
- P. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2023.
- Q. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2023.
- R. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- S. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2020.

Issuance - PERMIT REVISIONS

Issued: 2024.1.29

- T. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).
- U. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2019, with Editorial Revision (2022).
- V. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2023, with Editorial Revision.
- W. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2017.
- X. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2020.
- Y. ASTM D471 - Standard Test Method for Rubber Property--Effect of Liquids; 2016a (Reapproved 2021).
- Z. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types); 2023.
- AA. 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; 2018a.
- BB. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).
- CC. NSF 61 - Drinking Water System Components - Health Effects; 2023.
- DD. NSF 372 - Drinking Water System Components - Lead Content; 2022.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all items under this specification section in one submittal for review. Do not include products specified in other specification sections.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions. For each product, highlight model numbers, features, and accessories to be provided.
 - 1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.
 - 2. For chemical-resistant waterstops, provide data on ASTM D471 test results.
- C. Mix Design: Submit proposed concrete mix design.
- D. Test Reports: Submit report for each test or series of tests specified.
- E. Sustainable Design Submittal: If any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace Portland cement, submit the total volume of concrete cast in place, mix design(s) used showing the quantity of portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used.

1.05 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
- B. Follow recommendations of ACI 305R when concreting during hot weather.
- C. Follow recommendations of ACI 306R when concreting during cold weather.

1.06 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 FORMWORK

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

- B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.

2.02 REINFORCEMENT MATERIALS

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
 - 1. Type: Deformed billet-steel bars.
- B. Steel Welded Wire Reinforcement (WWR): Galvanized, plain type, ASTM A1064/A1064M.
 - 1. Form: Flat Sheets.
 - 2. Mesh Size and Wire Gage: As indicated on drawings.
- C. Reinforcement Accessories:
 - 1. Tie Wire: Annealed, minimum 16 gage, 0.0508 inch.
 - 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
 - 3. Provide stainless steel, galvanized, plastic, or plastic coated steel components for placement within 1-1/2 inches of weathering surfaces.

2.03 CONCRETE MATERIALS

- A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
 - 1. Acquire cement for entire project from same source.
- B. Fine and Coarse Aggregates: ASTM C33/C33M.
 - 1. Acquire aggregates for entire project from same source.
- C. Fly Ash: ASTM C618, Class F.
- D. Silica Fume: ASTM C1240, proportioned in accordance with ACI 211.1.
- E. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

2.04 ADMIXTURES

- A. Chemical Admixture:
 - 1. Manufacturers:
 - a. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- C. Air Entrainment Admixture: ASTM C260/C260M.
- D. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.
- E. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
- F. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.
- G. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
- H. Accelerating Admixture: ASTM C494/C494M Type C.
- I. Retarding Admixture: ASTM C494/C494M Type B.
- J. Water Reducing Admixture: ASTM C494/C494M Type A.

2.05 ACCESSORY MATERIALS

- A. Underslab Vapor Retarder: Sheet material complying with ASTM E1745, Class C; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. The use of single ply polyethylene is prohibited.
 - 1. Installation: Comply with ASTM E1643.
 - 2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
 - 3. Manufacturers:
 - a. ISI Building Products; Viper VaporCheck II 10-mil (Class C): www.isibp.com/#sle.

- b. Stego Industries, LLC; Stego Wrap Vapor Barrier Class C (10-mil):
www.stegoindustries.com/#sle.

2.06 BONDING AND JOINTING PRODUCTS

- A. Waterstops: Bentonite and butyl rubber, complying with NSF 61 and NSF 372.
 - 1. Configuration: Manufactured rectangular or trapezoidal strip.
 - 2. Size: 3/4" x 1".
- B. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.
 - 1. Material: ASTM D1751, cellulose fiber.

2.07 CURING MATERIALS

- A. Evaporation Reducer: Liquid thin-film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement.
- B. Curing Compound, Naturally Dissipating: Clear, water-based, liquid membrane-forming compound; complying with ASTM C309.
- C. Moisture-Retaining Sheet: ASTM C171.
 - 1. White-burlap-polyethylene sheet, weighing not less than 3.8 ounces per square yard.
- D. Water: Potable, not detrimental to concrete.

2.08 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
 - 1. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with ACI recommendations.
- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
 - 1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.
- D. Fiber Reinforcement: Add to mix at rate of 1.5 pounds per cubic yard, or as recommended by manufacturer for specific project conditions.
- E. Refer to structural drawings for required parameters for different applications.

2.09 MIXING

- A. On Project Site: Mix in drum type batch mixer, complying with ASTM C685/C685M. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.
- 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

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

3.02 PREPARATION

- A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.
- B. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

- C. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.

3.03 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

- A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
- B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.
- C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

3.04 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. Place concrete for floor slabs in accordance with ACI 302.1R.
- C. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- D. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.05 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.

3.06 FLOOR FLATNESS AND LEVELNESS TOLERANCES

- A. Maximum Variation of Surface Flatness:
 - 1. Exposed Concrete Floors: 1/8 inch in 10 feet.
 - 2. Under Seamless Resilient Flooring: 1/8 inch in 10 feet.
 - 3. Under Carpeting: 1/8 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.

3.07 CONCRETE FINISHING

- A. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
 - 1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI 302.1R; thick floor coverings include quarry tile and ceramic tile with full bed setting system.
 - 2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, thin set quarry tile, and thin set ceramic tile.
 - 3. Other Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.

3.08 CURING AND PROTECTION

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- C. Surfaces Not in Contact with Forms:

1. Initial Curing: Start as soon as free water has disappeared and before surface is dry.
Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
2. Final Curing: Begin after initial curing but before surface is dry.

3.09 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - 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. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.
- E. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards or less of each class of concrete placed.
- F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

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.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.11 PROTECTION

- A. Do not permit traffic over unprotected concrete floor surface until fully cured.

3.12 SCHEDULE - CONCRETE TYPES AND FINISHES

- A. Refer to structural drawings.

END OF SECTION

SECTION 04 20 00 - UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete block.
- B. Common brick.
- C. Mortar and grout.
- D. Reinforcement and anchorage.
- E. Flashings.
- F. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 04 05 11 - Masonry Mortaring and Grouting.
- B. Section 07 11 13 - Bituminous Dampproofing: Dampproofing parged masonry surfaces.
- C. Section 07 25 00 - Weather Barriers: Water-resistive barriers or air barriers applied to the exterior face of the backing sheathing or masonry.
- D. Section 07 62 00 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.
- E. Section 07 84 00 - Firestopping: Firestopping at penetrations of fire-rated masonry and at top of fire-rated walls.
- F. Section 07 92 00 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS

- A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata.
- B. ASTM C67/C67M - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile; 2023.
- C. ASTM C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile; 2017.
- D. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2023.
- E. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2023.
- F. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.
- G. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- H. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.
- I. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.
- J. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2018.
- K. ASTM C476 - Standard Specification for Grout for Masonry; 2023.
- L. ASTM C780 - Standard Test Methods for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2023.
- M. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2016.
- N. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all items under this specification section in one submittal for review. Do not include products specified in other specification sections.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories. For each product, highlight all model numbers, features, and accessories to be provided.
- C. Samples: Submit two samples of facing brick units to illustrate color, texture, and extremes of color range.

1.06 QUALITY ASSURANCE

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

- A. Concrete Block: Comply with referenced standards and as follows:
 - 1. Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depth of 8 inches.
 - 2. Non-Loadbearing Units: ASTM C129.
 - a. Hollow block, as indicated.

2.02 MORTAR AND GROUT MATERIALS

- A. Mortar and Grout: As specified in Section 04 05 11.
- B. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.
 - 1. Not more than 0.60 percent alkali.
- C. Hydrated Lime: ASTM C207, Type S.
- D. Mortar Aggregate: ASTM C144.
- E. Grout Aggregate: ASTM C404.
- F. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
 - 1. Color(s): As selected by Architect from manufacturer's full range.
 - 2. Manufacturers:
 - a. Davis Colors, a division of Venator Materials PLC: www.daviscolors.com/#sle.
 - b. Lambert Corporation: www.lambertusa.com/#sle.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.
- G. Water: Clean and potable.
- H. Accelerating Admixture: Nonchloride type for use in cold weather.

2.03 ACCESSORIES

- A. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding; in maximum lengths available.
- B. Lap Sealants and Tapes: As recommended by flashing manufacturer; compatible with membrane and adhesives.
- C. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.04 MORTAR AND GROUT MIXING

- A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
 - 1. Exterior, non-loadbearing masonry: Type N.
- B. New Mortar for Old Brick: Proportion by volume only; no more than 20 percent of the total volume of Portland cement and lime combined to be Portland cement.
 - 1. Repointing Mortar: Use proportions from 1 part lime to 2 parts sand with no Portland cement, up to 2 parts Portland cement to 3 parts lime to 6 parts sand.
- C. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.
- D. Admixtures: Add to mixture at manufacturer's recommended rate and in accordance with manufacturer's instructions; mix uniformly.
- E. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
- B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COLD AND HOT WEATHER REQUIREMENTS

- A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.
- B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

3.04 COURSING

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units:
 - 1. Bond: Running.
 - 2. Coursing: One unit and one mortar joint to equal 8 inches.
 - 3. Mortar Joints: Concave.

3.05 PLACING AND BONDING

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- B. Lay hollow masonry units with face shell bedding on head and bed joints.
- C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- D. Remove excess mortar and mortar smears as work progresses.
- E. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.
- F. Interlock intersections and external corners.
- G. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

- H. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- I. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.
- J. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.
- K. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.06 TOLERANCES

- A. Install masonry within the site tolerances found in TMS 402/602.
- B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- F. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch.
- G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.07 CUTTING AND FITTING

- A. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.08 PARGING

- A. Dampen masonry walls prior to parging.
- B. Scarify each parging coat to ensure full bond to subsequent coat.
- C. Parge masonry walls in two uniform coats of mortar to a total thickness of 3/4 inch.
- D. Steel trowel surface smooth and flat with a maximum surface variation of 1/8 inch per foot.
- E. Strike top edge of parging at 45 degrees.

3.09 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.
- B. Clay Masonry Unit Tests: Test each variety of clay masonry in accordance with ASTM C67/C67M requirements, sampling 5 randomly chosen units for each 50,000 installed.
- C. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.

3.10 CLEANING

- A. Remove excess mortar and mortar droppings.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. Use non-metallic tools in cleaning operations.

3.11 PROTECTION

- A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 05 52 13 - PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wall mounted handrails.
- B. Free-standing railings at steps and ramps.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Placement of anchors in concrete.
- B. Section 04 20 00 - Unit Masonry: Placement of anchors in masonry.
- C. Section 09 91 13 - Exterior Painting: Paint finish.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
- C. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2021.
- D. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- E. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all items under this specification section in one submittal for review. Do not include products specified in other specification sections.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

1.05 QUALITY ASSURANCE

- A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.
- B. Fabricator Qualifications:
 - 1. A company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.

PART 2 PRODUCTS

2.01 RAILINGS - GENERAL REQUIREMENTS

- A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.
- B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 50 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935
- C. Allow for expansion and contraction of members and building movement without damage to connections or members.
- D. Dimensions: See drawings for configurations and heights.
 - 1. Top Rails and Wall Rails: 1-1/2 inches diameter, round.
 - 2. Intermediate Rails: 1-1/2 inches diameter, round.
 - 3. Posts: 1-1/2 inches diameter, round.
- E. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are

unavoidable provide flush countersunk fasteners.

1. For anchorage to masonry, provide brackets to be embedded in masonry, for bolting anchors.
- F. Provide slip-on non-weld mechanical fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.
- 2.02 STEEL RAILING SYSTEM
- A. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
 - B. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
 - C. Exposed Fasteners: No exposed bolts or screws.
 - D. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.03 FABRICATION

- A. Accurately form components to suit specific project conditions and for proper connection to building structure.
- B. Fit and shop assemble components in largest practical sizes for delivery to site.
- C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
- D. Welded Joints:
 1. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
 2. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

- A. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.
- B. Apply one coat of bituminous paint to concealed aluminum surfaces that will be in contact with cementitious or dissimilar materials.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
- C. Install railings in compliance with ADA Standards for accessible design at applicable locations.
- D. Anchor railings securely to structure.
- E. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

END OF SECTION

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Non-structural dimension lumber framing.
- B. Rough opening framing for doors, windows, and roof openings.
- C. Sheathing.
- D. Subflooring.
- E. Roof sheathing with factory applied roofing underlayment.

1.02 RELATED REQUIREMENTS

- A. Section 09 21 16 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.03 REFERENCE STANDARDS

- A. PS 20 - American Softwood Lumber Standard; 2021.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all items under this specification section in one submittal for review. Do not include products specified in other specification sections.
- B. Product Data: Provide technical data on insulated sheathing, wood preservative materials, and application instructions. For each product, highlight all model numbers, features, and accessories to be provided.
- C. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

1.06 WARRANTY

- A. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.

2.02 CONSTRUCTION PANELS

- A. Subflooring: Any PS 2 type, rated Sheathing.

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.

3.02 FRAMING INSTALLATION

- A. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AWC (WFCM) Wood Frame Construction Manual.
- B. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.

- C. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

3.03 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 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.
- C. Provide the following specific non-structural framing and blocking:
 - 1. Cabinets and shelf supports.
 - 2. Grab bars.
 - 3. Towel and bath accessories.

3.04 INSTALLATION OF CONSTRUCTION PANELS

- A. Subflooring: Glue and nail to framing; staples are not permitted.

SECTION 06 20 00 - FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Finish carpentry items.
- B. Wood door frames, glazed frames.
- C. Hardware and attachment accessories.

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.
- B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures. Furnish all items under this specification section in one submittal for review. Do not include products specified in other specification sections.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver factory-fabricated units to project site in original packages, containers or bundles bearing brand name and identification.
- B. Store finish carpentry items under cover, elevated above grade, and in a dry, well-ventilated area not exposed to heat or sunlight.
- C. Protect from moisture damage.
- D. Handle materials and products to prevent damage to edges, ends, or surfaces.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

- A. Interior Woodwork Items:
 - 1. Moldings, Bases, Casings, and Miscellaneous Trim: Clear white pine; prepare for paint finish.

2.02 FABRICATION

- A. Shop assemble work for delivery to site, permitting passage through building openings.
- B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Set and secure materials and components in place, plumb and level.
- B. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

END OF SECTION

SECTION 07 14 00 - FLUID-APPLIED WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fluid-Applied Waterproofing:
 - 1. Cold-applied rubberized asphalt waterproofing.

1.02 RELATED REQUIREMENTS

- A. Section 04 20 00 - Unit Masonry: Masonry joints prepared to receive flashings.

1.03 REFERENCE STANDARDS

- A. ASTM C836/C836M - Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course; 2018 (Reapproved 2022).
- B. ASTM C1306/C1306M - Standard Test Method for Hydrostatic Pressure Resistance of a Liquid-Applied Waterproofing Membrane; 2008 (Reapproved 2023).
- C. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).
- D. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 2008a (Reapproved 2019).
- E. ICC-ES AC29 - Acceptance Criteria for Cold, Liquid-Applied, Below-Grade, Exterior Dampproofing and Waterproofing Materials; 2011, with Editorial Revision (2020).
- F. NRCA (WM) - The NRCA Waterproofing Manual; 2021.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data for membrane, surface conditioner, and flexible flashings.
- C. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and acceptable installation temperatures.

1.05 FIELD CONDITIONS

- A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application and until cured.

1.06 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Cold-Applied Rubberized Asphalt Waterproofing:

2.02 WATERPROOFING APPLICATIONS

- A. Cold-Applied Rubberized Asphalt Waterproofing:
 - 1. Location: at masonry infill of existing basement window locations to be removed.

2.03 FLUID APPLIED WATERPROOFING MATERIALS

- A. Cold-Applied Rubberized Asphalt Waterproofing: Rubberized asphaltic compound, suitable for installation on concrete and concrete masonry.
 - 1. Cured Thickness: 60 mils, 0.060 inch, minimum.
 - 2. Comply with ICC-ES AC29 acceptance criteria.
 - 3. Hydrostatic Pressure Resistance: Tested in accordance with ASTM C1306/C1306M, 50 psi, minimum by rapid test, and 35 psi, minimum by long term test.
 - 4. Low Temperature Resistance: No cracking, loss of adhesion, splitting or pinholes when tested at minus 15 degrees F in accordance with ASTM C836/C836M.

Issuance - PERMIT REVISIONS

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5. Adhesion: No separation when tested in accordance with ASTM C836/C836M.
6. Decay Resistance: No decay when tested in accordance with ASTM E154/E154M.
7. Wet Film Sag Resistance: Maximum sag within plus/minus 5 mils when tested in accordance with ASTM C836/C836M.
8. Water Vapor Permeance: 1 perm, maximum, when tested in accordance with ASTM E96/E96M.
9. Heat Aging Resistance: No cracking, splitting, or pinholes when tested in accordance with ASTM C836/C836M.
10. Elongation at Break: 1,000 percent, minimum, when tested in accordance with ASTM D412.
11. Products:
 - a. Basis of Design: Henry 787 Elastomeric Fluid Applied Waterproofing Membrane
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify substrate surfaces are free of frozen matter, dampness, loose particles, cracks, pits, projections, penetrations, or foreign matter detrimental to adhesion or application of waterproofing system.
- C. Verify that substrate surfaces are smooth, free of honeycomb or pitting, and not detrimental to full contact bond of waterproofing materials.

3.02 PREPARATION

- A. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions.
- B. Fill non-moving joints and cracks with a filler compatible with waterproofing materials.

3.03 INSTALLATION

- A. Install waterproofing to specified minimum thickness in accordance with manufacturers instructions and NRCA (WM) applicable requirements.
- B. Seal membrane and flashings to adjoining surfaces.

END OF SECTION

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes joint sealants for scheduled applications, including those specified by reference to this section.

1.2 PRECONSTRUCTION TESTING

- A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers four samples of materials that will contact or affect joint sealants. Use ASTM C 1087 or manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
- B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates. Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

1.3 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples: For each kind and color of joint sealant required.
- C. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.

1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Preconstruction compatibility and adhesion test reports.
- C. Preconstruction field-adhesion test reports.
- D. Field-adhesion test reports.
- E. Warranties.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.
- B. Preinstallation Conference: Conduct conference at Project site.

1.6 WARRANTY

- A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - 1. Architectural Sealants: 250 g/L.
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 - 3. Sealant Primers for Porous Substrates: 775 g/L.
- B. Low-Emitting Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
 - 1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.
- D. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

- E. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

2.2 SILICONE JOINT SEALANTS

- A. Mildew-Resistant or Neutral-Curing or Acid-Curing Silicone Joint Sealant: ASTM C 920.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Building Systems.
 - b. Dow Corning Corporation.
 - c. GE Advanced Materials - Silicones.
 - d. Pecora Corporation.
 - e. Polymeric Systems, Inc.
 - f. Sika Corporation; Construction Products Division.
 - g. Tremco Incorporated.
 - 2. Type: Single component (S) or multicomponent (M).
 - 3. Grade: Pourable (P) or nonsag (NS).
 - 4. Class: per schedule.
 - 5. Uses Related to Exposure: Traffic (T) or Nontraffic (NT).

2.3 URETHANE JOINT SEALANTS

- A. Urethane Joint Sealant: ASTM C 920.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Building Systems.
 - b. Bostik, Inc.
 - c. Pacific Polymers International, Inc.
 - d. Pecora Corporation.
 - e. Polymeric Systems, Inc.
 - f. Sika Corporation; Construction Products Division.
 - g. Tremco Incorporated.
 - 2. Type: Single component (S) or multicomponent (M).
 - 3. Grade: Pourable (P) or nonsag (NS).
 - 4. Class: Per schedule.
 - 5. Uses Related to Exposure: Traffic (T) or Nontraffic (NT).

2.4 LATEX JOINT SEALANTS

- A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Building Systems.
 - b. Bostik, Inc.
 - c. Pecora Corporation.
 - d. Tremco Incorporated.

2.5 PREFORMED JOINT SEALANTS

- A. Preformed Foam Joint Sealant: Manufacturer's standard preformed, precompressed, open-cell foam sealant manufactured from urethane foam with minimum density of 10 lb/cu. ft. and impregnated with a nondrying, water-repellent agent. Factory produce in precompressed sizes in roll or stick form to fit joint widths indicated; coated on one side with a pressure-sensitive adhesive and covered with protective wrapping.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dayton Superior Specialty Chemicals.
 - b. EMSEAL Joint Systems, Ltd.
 - c. Sandell Manufacturing Co.
 - d. Schul International, Inc.
 - e. Willseal USA, LLC.

2.6 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Pecora Corporation .
 - b. USG Corporation.

2.7 JOINT SEALANT BACKING

- A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) Type O (open-cell material) Type B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

2.8 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
 - 1. Remove laitance and form-release agents from concrete.
 - 2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION

- A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
- F. Acoustical Sealant Installation: Comply with ASTM C 919 and with manufacturer's written recommendations.
- G. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.3 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
 - 1. Extent of Testing: Test completed and cured sealant joints as follows:
 - a. Perform 10 tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.
 - b. Perform 1 test for each 1000 feet of joint length thereafter or 1 test per each floor per elevation.
 - 2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
- B. Evaluation of Field-Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.4 JOINT-SEALANT SCHEDULE

- A. Refer to Joint Sealant Usage Schedule, Section 07 92 00.13 for areas of application and color selection.

END OF SECTION 07 92 00

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Non-fire-rated hollow metal doors and frames.
- B. Thermally insulated hollow metal doors with frames.
- C. Hollow metal borrowed lites glazing frames.
- D. Accessories, including glazing.

1.02 RELATED REQUIREMENTS

- A. Section 08 71 00 - Door Hardware.
- B. Section 08 80 00 - Glazing: Glass for doors and borrowed lites.
- C. Section 09 91 13 - Exterior Painting: Field painting.
- D. Section 09 91 23 - Interior Painting: Field painting.

1.03 ABBREVIATIONS AND ACRONYMS

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; 2022.
- C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames; 2020.
- 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; 2020.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- 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; 2023.
- 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. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.
- J. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- K. ITS (DIR) - Directory of Listed Products; Current Edition.
- L. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
- M. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.
- N. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2017.
- O. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2014.
- P. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.
- Q. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.
- R. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2023.
- S. UL (DIR) - Online Certifications Directory; Current Edition.
- T. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all items under this specification section in one submittal for review. Submit with all door sections and Door Hardware.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines. For each product, highlight all model numbers, features, and accessories to be provided.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

1.06 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.
 - 2. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
 - 3. Steelcraft, an Allegion brand: www.allegion.com/#sle.
 - 4. Substitutions: See Section 01 60 00 - 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: Manufacturers standard.
 - 7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
 - 8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvanized) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
 - a. Based on SDI Standards: Provide at least A40/ZF120 (galvanized) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvanized) for corrosive locations.
- 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 2 - Heavy-duty.
 - b. Physical Performance Level B 500 000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 1 - Full Flush.
 - d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.
 - e. Zinc Coating: A60/ZF180 galvanized coating; ASTM A653/A653M.
 - 2. Door Core Material: Vertical steel stiffeners with fiberglass batts.
 - 3. Door Thermal Resistance: As indicated on the drawings.
 - 4. Door Thickness: 1-3/4 inch, nominal.
 - 5. Weatherstripping: Refer to Section 08 71 00.
- 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 1 - Full Flush.
 - d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.
 - e. Zinc Coating: A60/ZF180 galvanized coating; ASTM A653/A653M. Provide where indicated on the drawings.
 - 2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
 - 3. Provide insulated door(s) at locations indicated on the drawings. Thermal resistance as indicated on the drawings.
 - 4. Door Thickness: 1-3/4 inch, 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 1 - Full Flush.
 - d. Door Face Metal Thickness: 18 gage, 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. Temperature-Rise Rating (TRR) Across Door Thickness: In accordance with local building code and authorities having jurisdiction.
 - 4. Provide units listed and labeled by UL (DIR) or ITS (DIR).
 - a. Attach fire rating label to each fire rated unit.
 - 5. Door Core Material: Manufacturers standard core material/construction in compliance with requirements.
 - 6. Provide insulated door(s) at locations indicated on the drawings. Thermal resistance as indicated on the drawings.
 - 7. Door Thickness: 1-3/4 inch, nominal.

2.04 HOLLOW METAL FRAMES

- A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
- B. Frame Finish: Factory primed and field finished.
- C. Exterior Door Frames: Full profile/continuously welded type.
 - 1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
 - 2. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
 - 3. Weatherstripping: Separate, see Section 08 71 00.
- D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
 - 1. Frame Metal Thickness: 16 gage, 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: 16 gage, 0.053 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. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
- I. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inch high to fill opening without cutting masonry units.
- J. Frames Wider than 48 inches: Reinforce with steel channel fitted tightly into frame head, flush with top.

2.05 FINISHES

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
- B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

2.06 ACCESSORIES

- A. Door Window Frames: Door window frames with glazing securely fastened within door opening.
 - 1. Size: As indicated on drawings.
 - 2. Frame Material: 18 gage, 0.0478 inch, galvanized steel.
 - 3. Glazing as indicated on the drawings and specified in Section 08 80 00.
- B. Glazing: As specified in Section 08 80 00, factory installed.
- C. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.
- D. Mechanical Fasteners for Concealed Metal-to-Metal Connections: Self-drilling, self-tapping, steel with electroplated zinc finish.
- E. Grout for Frames: Portland cement grout with maximum 4 inch slump for hand troweling; thinner pumpable grout is prohibited.
- F. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.
- G. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.

- C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

- A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

- A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
- B. Install fire rated units in accordance with NFPA 80.
- C. Coordinate frame anchor placement with wall construction.
- D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
- E. Install door hardware as specified in Section 08 71 00.
 - 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 80 00.
- G. Coordinate installation of electrical connections to electrical hardware items.
- H. Touch up damaged factory finishes.

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 Schedule on the drawings.

END OF SECTION

SECTION 08 14 16 - 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 06 20 00 - Finish Carpentry: Wood door frames.
- B. Section 08 11 13 - Hollow Metal Doors and Frames.
- C. Section 08 71 00 - Door Hardware.
- D. Section 08 80 00 - Glazing.
- E. Section 09 91 23 - Interior Painting: Field finishing of doors.

1.03 REFERENCE STANDARDS

- A. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- B. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.
- C. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.
- D. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- E. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2021, with Errata (2022).

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all items under this specification section in one submittal for review. Submit with all door sections and Door Hardware.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics. For each product, highlight all model numbers, features, and accessories to be provided.
- 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 2 inch in size illustrating wood grain, stain color, and sheen.
- E. Specimen warranty.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than ten (10) years of documented 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. Inspect for damage.
- C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Interior Doors: Provide manufacturer's warranty for the life of the installation.
- C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wood Veneer Faced Doors:

1. Masonite Architectural Door: Aspiro Series; www.architectural.masonite.com
2. Eggers Industries: www.eggersindustries.com/#sle.
3. Haley Brothers: www.haleybros.com/#sle.
4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DOORS

A. Doors: Refer to drawings for locations and additional requirements.

1. Quality Standard: Custom Grade, Standard Duty performance, in accordance with WDMA I.S. 1A.
- 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.
- C. Hollow Core Doors: Type - Standard (FSHC); plies and faces as indicated above.

2.04 DOOR FACINGS

- A. Veneer Facing for Transparent Finish: 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: Any option allowed by quality standard for grade.
 2. "Running Match" each pair of doors and doors in close proximity to each other.
 3. "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 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. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
- E. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
- F. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
1. Exception: Doors to be field finished.
- G. Cut and configure exterior door edge to receive recessed weatherstripping devices.
- H. Provide edge clearances in accordance with the quality standard specified.

2.06 FACTORY FINISHING - WOOD VENEER DOORS

- A. Provide manufacturer's standard factory finish as indicated above.

- B. Finish work in accordance with WDMA I.S. 1A for grade specified and as follows:
- C. Factory finish doors in accordance with approved sample.
- D. Seal door top edge with color sealer to match door facing.

2.07 ACCESSORIES

- A. Glazing: As specified in Section 08 80 00.
- B. Glazing Stops: Wood, of same species as door facing, mitered corners; prepared for countersink style tamper proof screws.

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

SECTION 087100 – DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes:

- 1. Mechanical and electrified door hardware for:
 - a. Swinging doors.
- 2. Field verification, preparation and modification of existing doors and frames to receive new door hardware.

- B. Exclusions: Unless specifically listed in hardware sets, hardware is not specified in this section for:

- 1. Windows
- 2. Cabinets (casework), including locks in cabinets
- 3. Signage
- 4. Toilet accessories

- C. Related Sections:

- 1. Division 01 Section “General Requirements”
- 2. Division 06 Section “Finish Carpentry”
- 3. Division 08 Section “Hollow Metal Doors and Frames”
- 4. Division 08 Section “Wood Doors”
- 5. Division 26 Sections for connections to electrical power system and low-voltage wiring.
- 6. Division 28 Sections for coordination with other components of electronic access control system.

1.3 REFERENCES

- A. Fire/Life Safety

- 1. NFPA - National Fire Protection Association
 - a. NFPA 70 - National Electric Code
 - b. NFPA 80 - Standard for Fire Doors and Fire Windows
 - c. NFPA 101 - Life Safety Code
 - d. NFPA 105 - Smoke and Draft Control Door Assemblies

- B. UL - Underwriters Laboratories

1. UL 10C - Positive Pressure Test of Fire Door Assemblies
2. UL 1784 - Air Leakage Tests of Door Assemblies
3. UL 305 - Panic Hardware

C. Accessibility

1. ADA - 2010 ADA Standards for Accessible Design.
2. ICC/ANSI A117.1 - Accessible and Usable Buildings and Facilities.

D. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Key Systems and Nomenclature

E. ANSI - American National Standards Institute

1. ANSI/BHMA A156.1 - A156.29, and ANSI A156.31 - Standards for Hardware and Specialties

1.4 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 requirements.
2. Highlight, encircle, or otherwise specifically identify on submittals deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
3. Prior to forwarding submittal, comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, "EXAMINATION" article, herein.

B. Action Submittals:

1. Product Data: Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements, including electrical Riser Diagrams based on submitted hardware schedule.
2. Samples for Verification: If requested by Architect, submit production sample or sample installations of each type of exposed hardware unit in finish indicated, and tagged with full description for coordination with schedule.
 - a. Samples will be returned to supplier in like-new condition. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
3. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:
 - a. Door Index; include door number, heading number, and Architects hardware set number.
 - b. Opening Lock Function Spreadsheet: List locking device and function for each opening.

- c. Type, style, function, size, and finish of each hardware item.
- d. Name and manufacturer of each item.
- e. Fastenings and other pertinent information.
- f. Location of each hardware set cross-referenced to indications on Drawings.
- g. Explanation of all abbreviations, symbols, and codes contained in schedule.
- h. Mounting locations for hardware.
- i. Door and frame sizes and materials.
- j. Name and phone number for local manufacturer's representative for each product.
- k. Operational Description of openings with any electrified hardware (locks, exits, electromagnetic locks, electric strikes, automatic operators, door position switches, magnetic holders or closer/holder units, and access control components).
Operational description should include how door will operate on egress, ingress, and fire and smoke alarm connection.
 - 1) Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings and Electrical Riser Diagrams. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work that is critical in Project construction schedule.

4. Key Schedule:

- a. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system's function, key symbols used and door numbers controlled.
- b. Use ANSI A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
- c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
- d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
- e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
 - 1) Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
- f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

5. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory prepared for door hardware installation.

C. Informational Submittals:

- 1. Qualification Data: For Supplier, Installer and Architectural Hardware Consultant.
- 2. Product Certificates for electrified door hardware, signed by manufacturer:
 - a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
- 3. Certificates of Compliance:
 - a. Certificates of compliance for fire-rated hardware and installation instructions if requested by Architect or Authority Having Jurisdiction.
 - b. Installer Training Meeting Certification: Letter of compliance, signed by Contractor, attesting to completion of installer training meeting specified in "QUALITY ASSURANCE" article, herein.

4. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by qualified testing agency, for door hardware on doors located in accessible routes.
5. Warranty: Special warranty specified in this Section.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
 - a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Name, address, and phone number of local representative for each manufacturer.
 - d. Parts list for each product.
 - e. Final approved hardware schedule, edited to reflect conditions as-installed.
 - f. Final keying schedule
 - g. Copies of floor plans with keying nomenclature
 - h. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

1.5 QUALITY ASSURANCE

- A. Product Substitutions: Comply with product requirements stated in Division 01 and as specified herein.
 1. Where specific manufacturer's product is named and accompanied by "Owners Standard," including make or model number or other designation, provide product specified. (Note: Certain products have been selected for their unique characteristics and particular project suitability and have been named as "Owners' Standards")
 - a. Where no additional products or manufacturers are listed in product category, requirements for "Owners Standard" govern product selection.
 2. Where products indicate "acceptable substitute" or "acceptable manufacturer", provide product from specified manufacturers, subject to compliance with specified requirements and "Single Source Responsibility" requirements stated herein.
- B. Supplier Qualifications and Responsibilities: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides certified Architectural Hardware Consultant (AHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
 1. Warehousing Facilities: In Project's vicinity.
 2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
 3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
 4. Coordination Responsibility: Coordinate installation of electronic security hardware with Architect and electrical engineers and provide installation and technical data to Architect and other related subcontractors.
 - a. Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.

- C. Installer Qualifications: Qualified tradesmen, skilled in application of commercial grade hardware with record of successful in-service performance for installing door hardware similar in quantity, type, and quality to that indicated for this Project.
- D. Architectural Hardware Consultant Qualifications: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
 - 1. For door hardware, DHI-certified, Architectural Hardware Consultant (AHC).
 - 2. Can provide installation and technical data to Architect and other related subcontractors.
 - 3. Can inspect and verify components are in working order upon completion of installation.
 - 4. Capable of producing wiring diagrams.
- E. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.
 - 1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated.
- F. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.
- G. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
 - 1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.
- H. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release latch. Locks do not require use of key, tool, or special knowledge for operation.
- I. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in “REFERENCES” article, herein.
 - 1. Provide operating devices that do not require tight grasping, pinching, or twisting of wrist and that operate with force of not more than 5 lbf (22.2 N).
 - 2. Maximum opening-force requirements:
 - a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
 - b. Sliding or Folding Doors: 5 lbf (22.2 N) applied parallel to door at latch.
 - c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - 3. Bevel raised thresholds with slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.
 - 4. Adjust door closer sweep periods so that, from open position of 70 degrees, door will take at least 3 seconds to move to 3 inches (75 mm) from latch, measured to leading edge of door.
- J. Keying Conference: Conduct conference at Project site to comply with requirements in Division 01.

1. Attendees: Owner, Contractor, Architect, Installer, Owner's security consultant, and Supplier's Architectural Hardware Consultant.
2. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
 - a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 - b. Preliminary key system schematic diagram.
 - c. Requirements for key control system.
 - d. Requirements for access control.
 - e. Address for delivery of keys.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site.
- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
 1. Deliver each article of hardware in manufacturer's original packaging.
- C. Project Conditions:
 1. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
 2. Provide secure lock-up for door hardware delivered to Project, but not yet installed. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- D. Protection and Damage:
 1. Promptly replace products damaged during shipping.
 2. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work.
 3. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

1.7 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 03.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

- D. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.
1. Remove existing interfering hardware. All removed hardware shall remain the property of the Owner, unless otherwise directed.
 2. Remove all mechanical hold open devices from existing corridor and fire rated doors. Manual hold open closers shall be replaced or modified accordingly.
 3. This supplier shall be responsible to verify all existing condition and advise the architect of any discrepancies with scheduled hardware.
 4. Patch, repair and modify all doors, frames and hardware affected by scheduled replacement hardware.
 5. Install all surface mounted hardware on existing doors with thru bolts.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
1. Warranty Period: Years from date of Substantial Completion, for durations indicated.
 - a. Locksets: Grade 1
 - 1) Mechanical: 7 years.
 - 2) Electrified: 1 year.
 - b. Exit Devices:
 - 1) Mechanical: 3 years.
 - 2) Electrified: 1 year.
 - c. Closers:
 - 1) Mechanical: 10 years.
 - 2) Electrified: 2 years.
 - d. Balance of Hardware:
 - 1) Mechanical: 1 year.
 - 2) Electrified: 1 year.
 2. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.

1.9 MAINTENANCE

- A. Maintenance Tools:
1. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The Owner requires use of certain products for their unique characteristics and particular project suitability to insure continuity of existing and future performance and maintenance standards. After investigating available product offerings Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "Owners Standard".
 - 1. Where "Owners Standard" is noted, submittals and substitution requests for other products will not be considered.
- B. Approval of manufacturers other than those listed shall be in accordance with QUALITY ASSURANCE article, herein.
- C. Approval of products from manufacturers indicated as "Acceptable Manufacturer" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.
- D. Hand of Door: Drawings show direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
- E. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.2 MATERIALS

- A. Fasteners
 - 1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
 - 2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
 - 3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.
 - 4. Install hardware with fasteners provided by hardware manufacturer.
- B. Modification and Preparation of Existing Doors: Provide necessary fillers, Dutchmen, reinforcements, and fasteners, compatible with existing materials, as required for mounting new opening hardware and to cover existing door and frame preparations.
 - 1. Use materials which match materials of adjacent modified areas.
 - 2. When modifying existing fire-rated openings, provide materials permitted by NFPA 80 as required to maintain fire-rating.
- C. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

2.3 HINGES

A. Provide five-knuckle, ball bearing hinges.

1. Manufacturers and Products:

- a. Scheduled Manufacturer and Product: Ives 5BB1 series.
- b. Acceptable Manufacturers and Products: Bommer BB5000/ series, Hager BB1279/BB1168 Series.

B. Requirements:

1. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
 - a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
 - b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
2. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
 - a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
 - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
3. 2 inches or thicker doors:
 - a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
 - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
4. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
5. Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.
6. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
 - a. Steel Hinges: Steel pins
 - b. Non-Ferrous Hinges: Stainless steel pins
 - c. Out-Swinging Exterior Doors: Non-removable pins
 - d. Out-Swinging Interior Lockable Doors: Non-removable pins
 - e. Interior Non-lockable Doors: Non-rising pins
7. Width of hinges: 4-1/2 inches (114 mm) at 1-3/4 inch (44 mm) thick doors, and 5 inches (127 mm) at 2 inches (51 mm) or thicker doors. Adjust hinge width as required for door, frame, and wall conditions to allow proper degree of opening.
8. Doors 36 inches (914 mm) wide or less furnish hinges 4 ½ inches (114 mm) high; doors greater than 36 inches (914 mm) wide furnish hinges 5 inches (127 mm) high, heavy weight or standard weight as specified.

2.4 LOCKS & LATCHES - (COMMON AREA)

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Falcon W series.
2. Acceptable Manufacturers and Products: Sargent 6500, Schlage ALX series

B. Requirements:

1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3 hour fire doors.
2. Cylinders: Refer to “KEYING” article, herein.
3. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2 inch latch throw. Provide proper latch throw for UL listing at pairs.
4. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
5. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
7. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
 - a. Lever Design: Falcon - Latitude (LAT)
 - b. Tactile Warning (Knurling): Where required by authority having jurisdiction. Provide on levers on exterior (secure side) of doors serving rooms considered to be hazardous.

2.7 AUXILIARY LOCKS

A. Deadbolts:

1. Manufacturers and Products:
 - a. Scheduled Manufacturer and Product: Falcon D200 series
 - b. Acceptable Manufacturers and Products: Schlage B500 series
2. Requirements:
 - a. Provide deadbolt series conforming to ANSI/BHMA A156 and function as specified.
 - b. Cylinders: Refer to “KEYING” article, herein.
 - c. Provide deadbolts with standard 2-3/4 inches (70 mm) backset. Provide 2-3/8 inches (60 mm) where noted or if door or frame detail requires. Provide deadbolt with full 1 inch (25 mm) throw, constructed of steel alloy.
 - d. Provide manufacturer’s standard strike.

2.8 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Falcon 25 series
2. Acceptable Manufacturers and Products: Detex Advantex series, Von Duprin 98 series.

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1, and UL listed for Panic Exit or Fire Exit Hardware. Cylinders: Refer to “KEYING” article, herein.
2. Exit Devices: Touchpad type, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
3. Touchpad: Extend minimum of one half of door width. Match exit device finish or provide compatible finish. Provide compression springs in devices, latches, and outside trims or controls, tension springs also acceptable.
4. Provide devices with deadlatching feature for security and for future addition of alarm kits and other electrical requirements.

5. Provide manufacturer's standard strikes.
6. Provide exit devices cut to door width and height. Locate exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
7. Mount mechanism case flush on face of doors, or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
8. Provide cylinder dogging at non-fire-rated exit devices, unless specified "less dogging".
9. Where lever handles are specified as outside trim for exit devices, provide heavy-duty lever trims with forged or cast escutcheon plates. Provide vandal-resistant levers that will travel to 90-degree down position when more than 35 pounds of torque are applied, and which can easily be re-set.
 - a. Lever Style: Match lever style of locksets - Falcon - Latitude (LAT)
 - b. Tactile Warning (Knurling): Where required by authority having jurisdiction. Provide on levers on exterior (secure side) of doors serving rooms considered to be hazardous.
10. Provide UL labeled fire exit hardware for fire rated openings.
11. Field drill weep holes per manufacturer's recommendation for exit devices used in full exterior application, highly corrosive areas, and where noted in the hardware sets.

2.9 CYLINDERS AND CORES

A. Manufacturers:

1. Scheduled Manufacturer: Falcon
2. Acceptable manufacturers and Products: Sargent, Schlage

B. Requirements:

1. Provide cylinders/cores, from the same manufacturer of locksets, compliant with ANSI/BHMA A156.5; latest revision, Section 12, Grade 1; permanent cylinders; cylinder face finished to match lockset, manufacturer's series as indicated. Refer to "KEYING" article, herein.
2. Provide cylinders in the below-listed configuration(s), distributed throughout the Project as indicated.
 - a. Conventional Open: Cylinder with small format interchangeable core (SFIC) with open keyway.
4. Replaceable Construction Cores.
 - b. Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
 - 1) Three (3) construction control keys
 - 2) Twelve (12) construction change (day) keys.
 - c. Contractor and Owner's Representative will replace temporary construction cores with permanent cores. Contractor shall immediately return all temporary cores to the original supplier as soon as possible.

2.10 KEYING

- A. Provide a factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.
- B. Requirements:
 - 1. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
 - a. Keying system as directed by the Owner.
 - 2. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements shall be cause for replacement of cylinders/cores involved at no additional cost to Owner.
 - 3. Provide keys with the following features.
 - a. Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
 - b. Identification.
 - 4. Identification:
 - a. Mark permanent cylinders/cores and keys with applicable blind code per DHI publication “Keying Systems and Nomenclature” for identification. Blind code marks shall not include actual key cuts.
 - b. Key Identification stamping provisions must be approved by the Architect and Owner.
 - c. Stamp keys with Owner’s unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with “DO NOT DUPLICATE”.
 - d. Failure to comply with stamping requirements shall be cause for replacement of keys involved at no additional cost to Owner.
 - 5. Quantity: Furnish in the following quantities.
 - a. Change (Day) keys: 4 four (4) per cylinder/core
 - b. Permanent Control Keys: Four (4).
 - c. Master Keys: Six (6) for each level of masterkeying used. (master, grand master, great grand master, etc.)

2.11 KEY CONTROL SYSTEM

- A. Key Control System Manufacturers:
 - 1. Scheduled Manufacturer: Telkee
 - 2. Acceptable Manufacturers: HPC, Lund
- B. Requirements:
 - 1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.
 - a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
 - b. Provide hinged-panel type cabinet for wall mounting.

2.12 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Falcon SC71A series.
2. Acceptable Manufacturers and Products: LCN 4040 series, Sargent 1431 series.

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory.
2. Provide parallel-arm door closers with fully hydraulic, full rack and pinion action with aluminum cylinder.
3. Closer Body: 1-1/4 inch (32 mm) diameter, with 5/8 inch (16 mm) diameter heat-treated pinion journal.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Pressure Relief Valve (PRV) Technology: Not permitted.
8. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.13 DOOR TRIM

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Trimco.

B. Requirements:

1. Provide push plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick and beveled 4 edges. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
2. Provide push bars of solid bar stock, diameter and length as scheduled. Provide push bars of sufficient length to span from center to center of each stile. Where required, mount back to back with pull.
3. Provide offset pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
4. Provide flush pulls as specified. Where required, provide back-to-back mounted model.
5. Provide pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
6. Provide pull plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick, beveled 4 edges, and prepped for pull. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
7. Provide wire pulls of solid bar stock, diameter and length as scheduled.

2.14 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Trimco

B. Requirements:

1. Provide kick plates, mop plates, and armor plates minimum of 0.050 inch (1 mm) thick as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes of plates:
 - a. Kick Plates: 10 inches (254 mm) high by 1 ½ inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
 - b. Mop Plates: 4 inches (102 mm) high by 1 ½ inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
 - c. Armor Plates: 34 inches (914 mm) high by 1 ½ inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs

2.15 OVERHEAD STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers: Glynn-Johnson
2. Acceptable Manufacturers: ABH, Rixson

B. Requirements:

1. Provide heavy duty concealed mounted overhead stop or holder as specified for exterior and interior vestibule single acting doors.
2. Provide heavy duty concealed mounted overhead stop or holder as specified for double acting doors.
3. Provide heavy or medium duty and concealed or surface mounted overhead stop or holder for interior doors as specified. Provide medium duty surface mounted overhead stop for interior doors and at any door that swings more than 140 degrees before striking wall, open against equipment, casework, sidelights, and where conditions do not allow wall stop or floor stop presents tripping hazard.
4. Where overhead holders are specified provide friction type at doors without closer and positive type at doors with closer.

2.16 DOOR STOPS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Trimco

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
2. Where a wall stop cannot be used, provide universal floor stops for low or high rise options.

3. Where wall or floor stop cannot be used, provide medium duty surface mounted overhead stop.

2.17 WEATHER-STRIPPING, THRESHOLDS, GASKETING

A. Manufacturers:

1. Scheduled Manufacturer: Zero
2. Acceptable Manufacturers: NGP, Reese

B. Requirements:

1. Provide thresholds, weather-stripping (including door sweeps, seals, astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.
2. Size of thresholds:
 - a. Saddle Thresholds: 1/2 inch (13 mm) high by jamb width by door width
 - b. Bumper Seal Thresholds: 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width
3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.

2.18 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Trimco

B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

2.20 FINISHES

- A. Provide finish for each item as indicated in the hardware sets.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

- B. Existing Door and Frame Compatibility: Field verify existing doors and frames receiving new hardware and existing conditions receiving new openings. Verify that new hardware is compatible with existing door and frame preparation and existing conditions.
- C. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Where on-site modification of doors and frames is required:
 - 1. Remove existing hardware being replaced, tag, and store according to contract documents.
 - 2. Field modify and prepare existing door and frame for new hardware being installed.
 - 3. When modifications are exposed to view, use concealed fasteners, when possible.
 - 4. Prepare hardware locations in accordance with:
 - a. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
 - b. Wood Doors: DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."
 - c. Doors in rated assemblies: NFPA 80 for restrictions on on-site door hardware preparation.

3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
 - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 - 2. Custom Steel Doors and Frames: HMMA 831.
 - 3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- C. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- F. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

- H. Lock Cylinders: Install construction cores to secure building and areas during construction period.
 - 1. Replace construction cores with permanent cores as indicated in keying section.
- I. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- J. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers shall not be visible in corridors, lobbies and other public spaces unless approved by Architect.
- K. Closer/holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
- L. Thresholds: Shim and set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- M. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- N. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- O. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 FIELD QUALITY CONTROL

- A. Final Inspection: Contractor shall engage the Hardware Manufacturers Representative to perform inspections and to prepare inspection reports.
 - 1. Hardware Manufacturers Representative shall inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
 - 2. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

3.6 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.7 DEMONSTRATION

- A. Provide training for Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Division 01 Section "Demonstration and Training."

3.8 DOOR HARDWARE SCHEDULE

- A. Locksets, exit devices, and other hardware items are referenced in the following hardware sets for series, type and function. Refer to the above-specifications for special features, options, cylinders/keying, and other requirements.
- B. List of manufacturers used in hardware schedule:
 - 1. Ives <http://us.allegion.com/brands/ives/Pages/default.aspx>
 - 2. Falcon <http://us.allegion.com/brands/falcon/pages/default.aspx>
 - 3. Glynn Johnson <http://us.allegion.com/brands/glynn-johnson/pages/default.aspx>
 - 4. Schlage <http://us.allegion.com/brands/schlage/Pages/default.aspx>
 - 5. Zero International <http://www.zerointernational.com/catalogcadlibrary.aspx>
- C. Hardware Sets as follows:

Lucas Metropolitan Housing
 Task Order 2 – Richmar Manor
 Issuance – PERMIT REVISIONS

Hooker DeJong, Inc.
 2020.0072
 Issued: 2024.01.29

Set No. 01 - (Common Area Entry Doors)
 For use on Door #(s):
 101, 109

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA EXIT DEVICE	CD-25-R-EO	626	FAL
1	EA OFFICE/ENTRY LOCK	W501BDC LAT	626	FAL
1	EA MORT. CYL. HOUSING	C987 A12667-003 DOG - CAM & BLOCKING RING AS REQ'D	626	FAL
2	EA INTERCHANGABLE CORE	C607 SFIC	626	FAL
1	EA DOOR CLOSER	SC71A SS - PARALLEL ARM	689	FAL
1	EA KICK PLATE	8400 10"x1 1/2" LDW B-CS	630	IVE
1	EA WEATHERSTRIP	188SBK PSA COMPLETE WEATHERSTRIP, DOOR BOTTOM AND THRESHOLD PACKAGE	BK	ZER

OPERATIONAL DESCRIPTION:
 1. Lockset is normally secure.

Set No. 02 - (Laundry Room 2 Door)
 For use on Door #(s):
 107

Each To Have:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA OFFICE/ENTRY LOCK	W501BDC LAT	626	FAL
1	EA MORT. CYL. HOUSING	C987 A12667-003 DOG - CAM & BLOCKING RING AS REQ'D	626	FAL
2	EA INTERCHANGABLE CORE	C607 SFIC	626	FAL
1	EA DOOR CLOSER	SC71A SS - PARALLEL ARM	689	FAL
1	EA KICK PLATE	8400 10"x1 1/2" LDW B-CS	630	IVE
1	EA WEATHERSTRIP	188SBK PSA COMPLETE WEATHERSTRIP, DOOR BOTTOM AND THRESHOLD PACKAGE	BK	ZER

OPERATIONAL DESCRIPTION:
 1. Lockset is normally secure.

Set No. 03 - (Office Doors)
 For use on Door #(s):
 104, 105

Each To Have:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA OFFICE/ENTRY LOCK	W501BDC LAT	626	FAL
1	EA INTERCHANGABLE CORE	C607 SFIC	626	FAL
1	EA OH STOP & HOLDER	100HP	630	GLY
3	EA SILENCER	SR64	GRY	IVE

Set No. 04 - (Toilet Room Doors)
 For use on Door #(s):
 102, 103

Each To Have:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA PRIVACY LOCK W/INDICATOR	H2-171-LAT	626	FAL
1	EA DOOR CLOSER	SC71A SS - PARALLEL ARM	689	FAL
1	EA KICK PLATE	8400 10"x1 1/2" LDW B-CS	630	IVE
1	EA WALL STOP	WS406/407CVX	630	IVE
3	EA SILENCER	SR64	GRY	IVE

Hardware Schedule

Door #	Hardware Set #
101	01
102	04
103	04
104	03
105	03
107	02
109	01

END OF SECTION

SECTION 09 05 61 - COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
 - 1. Resilient tile and sheet.
- B. Removal of existing floor coverings.
- C. Preparation of new and existing concrete floor slabs for installation of floor coverings.
- D. Testing of concrete floor slabs for moisture and alkalinity (pH).
- E. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
 - 1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.
- F. Patching compound.
- G. Remedial floor coatings.
- H. Remedial floor sheet membrane.
- I. Preparation of new and existing wood-based floors and subfloors for installation of new floor coverings.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

- A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens); 2021.
- B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters, and Gypsum Concrete; 2020.
- C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.
- D. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.
- E. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.
- F. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; 2018.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all items under this specification section in one submittal for review. Do not include products specified in other specification sections.
- B. Visual Observation Report: For existing floor coverings to be removed.
- C. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing the below. For each product, highlight all model numbers, features, and accessories to be provided.
 - 1. Moisture and alkalinity (pH) limits and test methods.
 - 2. Manufacturer's required bond/compatibility test procedure.

- D. Testing Agency's Report:
 - 1. Description of areas tested; include floor plans and photographs if helpful.
 - 2. Summary of conditions encountered.
 - 3. Moisture and alkalinity (pH) test reports.
 - 4. Copies of specified test methods.
 - 5. Recommendations for remediation of unsatisfactory surfaces.
 - 6. Product data for recommended remedial coating.
 - 7. Submit report directly to Owner.
 - 8. Submit report not more than two business days after conclusion of testing.
- E. Adhesive Bond and Compatibility Test Report.
- F. Copy of RFCI (RWP).
- G. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation. For each product, highlight all model numbers, features, and accessories to be provided.

1.06 QUALITY ASSURANCE

- A. Contractor may perform adhesive and bond test with Contractor's own personnel or hire a testing agency.
- B. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
 - 1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.
- C. Contractor's Responsibility Relating to Independent Agency Testing:
 - 1. Provide access for and cooperate with testing agency.
 - 2. Confirm date of start of testing at least 10 days prior to actual start.
 - 3. Allow at least 4 business days on site for testing agency activities.
 - 4. Achieve and maintain specified ambient conditions.
 - 5. Notify Owner when specified ambient conditions have been achieved and when testing will start.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, handle, and protect products in accordance with manufacturer's instructions and recommendations.
- B. Deliver materials in manufacturer's packaging; include installation instructions.
- C. Keep materials from freezing.

1.08 FIELD CONDITIONS

- A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.
- B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
 - 1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.

2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.
 3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
- B. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.
- C. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

- A. Perform following operations in the order indicated:
1. Existing concrete slabs (on-grade and elevated) with existing floor coverings:
 - a. Visual observation of existing floor covering, for adhesion, water damage, alkaline deposits, and other defects.
 - b. Removal of existing floor covering.
 2. Existing concrete slabs with coatings or penetrating sealers/hardeners/dustproofers:
 - a. Do not attempt to remove coating or penetrating material.
 - b. Do not abrade surface.
 3. Preliminary cleaning.
 4. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
 5. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
 6. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
 7. Specified remediation, if required.
 8. Patching, smoothing, and leveling, as required.
 9. Other preparation specified.
 10. Adhesive bond and compatibility test.
 11. Protection.
- B. Remediations:
1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
 2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.
 3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 REMOVAL OF EXISTING FLOOR COVERINGS

- A. Comply with local, State, and federal regulations and recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings, as applicable to floor covering being removed.
- B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.03 PRELIMINARY CLEANING

- A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.
- B. Do not use solvents or other chemicals for cleaning.

3.04 MOISTURE VAPOR EMISSION TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.
- C. Test in accordance with ASTM F1869 and as follows.
- D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.
- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.
- F. Report: Report the information required by the test method.

3.05 INTERNAL RELATIVE HUMIDITY TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.
- C. Test in accordance with ASTM F2170 Procedure A and as follows.
- D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.
- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.
- F. Report: Report the information required by the test method.

3.06 ALKALINITY TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.
 - 1. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.
 - 2. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (pH) reading.

3. Use of a digital pH meter with probe is acceptable; follow meter manufacturer's instructions.
 - C. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.
 - D. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.
 - E. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (pH) reading.
 - F. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.
- 3.07 PREPARATION
- A. See individual floor covering section(s) for additional requirements.
 - B. Comply with requirements and recommendations of floor covering manufacturer.
 - C. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.
 - D. Do not fill expansion joints, isolation joints, or other moving joints.
- 3.08 ADHESIVE BOND AND COMPATIBILITY TESTING
- A. Comply with requirements and recommendations of floor covering manufacturer.
- 3.09 APPLICATION OF REMEDIAL FLOOR COATING
- A. Comply with requirements and recommendations of coating manufacturer.
- 3.10 INSTALLATION OF REMEDIAL FLOOR Sheet Membrane
- A. Install in accordance with sheet membrane manufacturer's instructions.
- 3.11 PROTECTION
- A. Cover prepared floors with building paper or other durable covering.
- END OF SECTION

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Performance criteria for gypsum board assemblies.
- B. Metal channel ceiling framing.
- C. Acoustic insulation.
- D. Gypsum sheathing.
- E. Cementitious backing board.
- F. Gypsum wallboard.
- G. Joint treatment and accessories.
- H. Textured finish system.
- I. Acoustic (sound-dampening) wall and ceiling board.

1.02 RELATED REQUIREMENTS

- A. Section 05 40 00 - Cold-Formed Metal Framing: Structural steel stud framing.
- B. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.

1.03 REFERENCE STANDARDS

- A. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2019.
- B. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).
- C. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2023.
- D. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2022.
- E. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.
- F. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.
- G. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2018.
- H. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2022, with Editorial Revision (2023).
- I. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.
- J. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
- K. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).
- L. ASTM E413 - Classification for Rating Sound Insulation; 2022.
- M. GA-216 - Application and Finishing of Gypsum Panel Products; 2021.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all items under this specification section in one submittal for review. Do not include products specified in other specification sections.
- B. Product Data: Provide data on metal framing, gypsum board, glass mat faced gypsum board, accessories, and joint finishing system. For each product, highlight all model numbers,

features, and accessories to be provided.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum 5 years of experience.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
 - 1. See PART 3 for finishing requirements.
- 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.

2.02 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
 - 1. CertainTeed Corporation: www.certainteed.com.
 - 2. Georgia-Pacific Gypsum: www.gpgypsum.com.
 - 3. National Gypsum Company: www.nationalgypsum.com.
 - 4. USG Corporation: www.usg.com/.
 - 5. Substitutions: See Section 01 60 00 - 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 at wet wall locations (sinks, toilets, electric water coolers).
 - 3. Paper-Faced Products:
 - 4. Mold Resistant Paper Faced Products:
 - 5. Glass Mat Faced Products:
- C. Backing Board For Wet Areas: One of the following products:
 - 1. Application: Surfaces behind tile in wet areas including toilet rooms.
 - 2. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
 - a. Thickness: 1/2 inch.
 - b. Products:
 - 1) Custom Building Products: www.custombuildingproducts.com.
 - 2) National Gypsum Company; PermaBase Cement Board: www.nationalgypsum.com/
 - 3) USG Corporation: www.usg.com.
 - 4) Substitutions: See Section 01 60 00 - Product Requirements.
 - 3. Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.

2.03 GYPSUM WALLBOARD ACCESSORIES

- A. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.

- B. 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.
 - 2. Expansion Joints:
- C. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
 - 1. Fiberglass Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
 - 2. Paper Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
 - 3. Joint Compound: Setting type, field-mixed.
- D. Textured Finish Materials: Latex-based compound; plain.
- E. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.
- F. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion resistant.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

- A. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
 - 1. Level ceiling system to a tolerance of 1/1200.
 - 2. Laterally brace entire suspension system.
- B. Studs: Space studs at 16 inches on center.
 - 1. Extend partition framing to structure where indicated and to ceiling in other locations.
 - 2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
 - 3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
- C. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
- D. Blocking: Install wood blocking for support of:
 - 1. Framed openings.
 - 2. Plumbing fixtures.
 - 3. Toilet accessories.

3.03 ACOUSTIC ACCESSORIES INSTALLATION

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.

3.04 BOARD INSTALLATION

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

- B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
 - 1. Exception: Tapered edges to receive joint treatment at right angles to framing.

3.05 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 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
- 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.

3.06 TEXTURE FINISH

- A. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions and to match approved sample.

END OF SECTION

SECTION 09 65 00 - RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Resilient tile flooring.
- B. Resilient base.
- C. Resilient stair accessories.
- D. Installation accessories.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 26 05 26 - Grounding and Bonding for Electrical Systems: Grounding and bonding of static control flooring to building grounding system.
- C. HUD Use of Materials Bulletin, UM 44d and UM72a.

1.03 REFERENCE STANDARDS

- A. ASTM F970 - Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading; 2022.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all items under this specification section in one submittal for review. Do not include products specified in other specification sections.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions. For each product, highlight all model numbers, features, and accessories to be provided.
- C. Verification Samples: Submit two samples, 6 by 6 inch min in size illustrating color and pattern for each resilient flooring product specified.
- D. Sustainable Design Submittal: Submit VOC content documentation for flooring and adhesives.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.

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.
- C. Testing Agency Qualifications: Independent firm specializing in performing concrete slab moisture testing and inspections of the type specified in this section.

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

1. Manufacturers:
 - a. Armstrong World Industries, Inc: www.armstrong.com
 - b. Johnsonite, a Tarkett Company: www.johnsonite.com
 - c. Shaw Contract: www.shawcontract.com
 - d. Patcraft: www.patcraft.com
 - e. Shaw Property Solutions: www.shawpropertiesolutions.com
2. Product: as indicated on drawings.
3. Tile Size: as indicated on drawings.
4. Color and Style: as indicated on drawings.
5. Orientation/Pattern: as indicated on drawings.
6. Luxury Vinyl Tile shall comply with States Housing Authorities Requirements.

2.02 RESILIENT BASE

A. Resilient Base: Cove

1. Manufacturers:
 - a. Johnsonite, a Tarkett Company
 - b. Roppe Corp
 - c. VPI
 - d. Patcraft
2. Height: as indicated on drawings.
3. Color: as indicated on drawings.
4. Accessories: Premolded external corners and internal corners.

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.
 1. VOC Content Limits: As specified in Section 01 61 16.
- C. Adhesive for Vinyl Flooring:
 1. Manufacturers:
 - a. Stauf USA, LLC; D737 High-Tack: www.staufusa.com/#sle.
 - b. As recommended by manufacturer.
 - c. Substitutions: Section 01 6000 - Product Requirements.
- D. Moldings, Transition and Edge Strips: Metal or Same material as flooring.

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. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- B. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor filler to achieve smooth, flat, hard surface.
- C. Prohibit traffic until filler is fully cured.
- D. Clean substrate.

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. At locations of static dissipative tile, place copper grounding strip in conductive adhesive and apply additional adhesive to top side of strip before installing static control flooring. Allow strip to extend beyond flooring in accordance with static control flooring manufacturer's instructions. Refer to Section 26 05 26 for grounding and bonding to building grounding system.
 - 3. Fit joints and butt seams tightly.
 - 4. 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.
 - 1. Metal Strips: Attach to substrate before installation of flooring using stainless steel screws.
 - 2. Resilient Strips: Attach to substrate using adhesive.
- F. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- G. Install flooring in recessed floor access covers, maintaining floor pattern.
- H. At movable partitions, install flooring under partitions without interrupting floor pattern.

3.04 Installation - Tile Flooring

- A. Mix tile from containers to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.
- B. Install plank tile with a random offset of at least 6 inches from adjacent rows.
- C. Direct glue tile, fit edges tightly per manufacturers recommendations

3.05 Installation - Resilient Base

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. At internal corners, use premolded units. At external corners, use premolded units. 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.

Lucas Metropolitan Housing
LMHA Task Order #2 - Richmar Manor
Issuance - PERMIT REVISIONS
END OF SECTION

Hooker DeJong, Inc.
2019.0072
Issued: 2024.1.29

SECTION 09 91 13 - EXTERIOR PAINTING

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes surface preparation and the application of paint systems on exterior substrates.
 - 1. Concrete
 - 2. Steel
 - 3. Galvanized Metal
 - 4. Stainless- steel Flashing
 - 5. Wood
 - 6. PVC (Plastic) Trim

1.02 DEFINITIONS

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- D. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- E. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- F. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples: For each type of paint system and each color and gloss of topcoat.
- C. Product List: For each product indicated. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

1.04 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.
- B. Maintenance Data: Submit coating maintenance manual including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (SDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

1.05 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.

- a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Products: Subject to compliance with requirements, comply with the following manufacturer:
 1. Basis of Design: Sherwin-Williams Co.

2.02 PAINT GENERAL

- A. A. MPI Standards: Unless otherwise specified provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
- B. B. Material Compatibility:
 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.
- D. Colors: As selected by Architect from manufacturer's full range
 1. 20 percent of surface area will be painted with deep tones.

2.03 BLOCK FILLERS

- A. Block Filler, Latex, Interior/Exterior: MPI #4
 1. Sherwin-Williams: PrepRite Block Filler, B25 Series

2.04 PRIMERS/SEALERS

- A. Primer, Alkali Resistant, Water Based: MPI #3.
 1. Sherwin-Williams: Loxon Concrete and Masonry Primer, A24 Series
- B. Primer, Bonding, Water Based: MPI #17.
 1. Sherwin-Williams: Extreme Bond Primer, B51 Series
- C. Wood-Knot Sealer: Primer, Alkyd/Oil for Exterior Wood: MPI #5.
 1. Sherwin-Williams: Exterior Oil Based Wood Primer, Y24 Series

2.05 METAL PRIMERS

- A. Primer, Alkyd, Anti-Corrosive for Metal: MPI #79.
 1. Sherwin-Williams: Kem Bond HS Universal Metal Primer, B50 Series
- B. Primer, Rust-Inhibitive, Waterbased: MPI #107.
 1. Sherwin-Williams: Pro Industrial Pro Cryl Universal Primer, B66 Series

2.06 WOOD PRIMER

- A. Primer, Latex for Exterior Wood: MPI #6.
 1. Sherwin-Williams: Exterior Latex Wood Primer, B42 Series

2.07 WATER-BASED PAINTS

- A. Latex, Exterior Flat (MPI Gloss Level 1): MPI #10.
 1. Sherwin-Williams: A-100 Exterior Acrylic Latex Flat, A6 Series
- B. Latex, Exterior, Low Sheen (MPI Gloss Level 3-4): MPI #15.
 1. Sherwin-Williams: A-100 Exterior Acrylic Latex Satin, A82 Series
- C. Latex, Exterior Semi-Gloss (Gloss Level 5): MPI #11.
 1. Sherwin-Williams: A-100 Exterior Acrylic Latex Gloss, A8 Series
- D. Light Industrial Coating, Exterior, Water Based, Semi-Gloss (Gloss Level 5): MPI #163.
 1. Sherwin-Williams: Pro Industrial Acrylic Semi-Gloss, B66 Series
- E. Light industrial coating, exterior, water based urethane, semi-gloss (Gloss Level 5).

1. Sherwin-Williams: Pro Industrial Waterbased Alkyd Urethane Enamel Semi-Gloss, B53 Series

2.08 TEXTURE AND HIGH-BUILD COATINGS

- A. Textured Coating, Latex, Flat: MPI #42.
 1. Sherwin-Williams: ConFlex XL Textured High Build (Course or Medium), A5 Series
- B. Latex, Exterior, High Build: MPI #40.
 1. Sherwin-Williams: Loxon XP, A24 Series

2.09 FLOOR COATINGS

- A. Sealer, Water Based, for Concrete Floors: MPI #99.
 1. Sherwin-Williams: H&C Clarishield Waterbased Clear Sealer Wet Look

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 1. Concrete: 12 percent.
 2. Masonry (Clay and CMU): 12 percent.
 3. Wood: 15 percent.
 4. Portland Cement Plaster: 12 percent.
 5. Gypsum Board: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
 1. Application of coating indicates acceptance of surfaces and conditions.

3.02 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.
- B. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulates.
 1. Remove incompatible primers and re-prime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

3.03 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.04 CLEANING AND PROTECTION

- A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.05 EXTERIOR PAINTING SCHEDULE

- A. Concrete Substrates, Nontraffic Surfaces:

1. Latex System:
 - a. Prime Coat: Primer, alkali resistant, water based, MPI #3.
 - 1) Sherwin-Williams: Loxon Concrete and Masonry Primer, A24 Series
 - b. Intermediate Coat: Latex, exterior, matching topcoat.
 - 1) Sherwin-Williams: A-100 Exterior Acrylic Latex Gloss, A8 Series
 - c. Topcoat: Latex, exterior gloss (Gloss Level 6), MPI #11.
 - 1) Sherwin-Williams: A-100 Exterior Acrylic Latex Gloss, A8 Series
- B. CMU:
 1. Latex System:
 - a. Prime Coat: Block Filler, Latex, Interior/Exterior, MPI #4.
 - 1) Sherwin-Williams: PrepRite Interior/Exterior Block Filler, B25 Series
 - b. Intermediate Coat: Latex, exterior, matching topcoat.
 - 1) Sherwin-Williams: A-100 Exterior Acrylic Latex Gloss, A8 Series
 - c. Topcoat: Latex, exterior gloss (Gloss Level 6), MPI #11.
 - 1) Sherwin-Williams: A-100 Exterior Acrylic Latex Gloss, A8 Series
 - C. Steel Substrates: Includes, but not limited to mechanical equipment i.e. joist, cover plates.
Does not include handrails
 1. Water-Based Light Industrial Coating System:
 - a. Prime Coat: Primer, Rust-Inhibitive, Waterbased: MPI #107. Except for harsh environments or structural steel see Section 05 12 00 "Structural Steel Framing" where substrate is specified.
 - 1) Sherwin-Williams: Pro Industrial Pro Cryl Universal Primer, B66 Series
 - b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
 - 1) Sherwin-Williams: Pro Industrial Acrylic Semi-Gloss, B66 Series
 - c. Topcoat: Light industrial coating, exterior, water based, semi-gloss (Gloss Level 5), MPI #163.
 - 1) Sherwin-Williams: Pro Industrial Acrylic Semi-Gloss, B66 Series
 - D. Steel Substrates: Handrails and high traffic doors
 1. Water-Based Light Industrial Coating System:
 - a. Prime Coat: Primer, Rust-Inhibitive, Waterbased: MPI #107.
 - 1) Sherwin-Williams: Pro Industrial Pro Cryl Universal Primer, B66 Series
 - b. Intermediate Coat: Light industrial coating, exterior, water based urethane, matching topcoat.
 - 1) Sherwin-Williams: Pro Industrial Waterbased Alkyd Urethane Enamel Semi-Gloss, B53
 - c. Topcoat: Light industrial coating, exterior, water based urethane, semi-gloss (Gloss Level 5).
 - 1) Sherwin-Williams: Pro Industrial Waterbased Alkyd Urethane Enamel Semi-Gloss, B53 Series
 - E. Galvanized-Metal Substrates:
 1. Water-Based Light Industrial Coating System:
 - a. Prime Coat: Primer, galvanized, Water Based: MPI #134.
 - 1) Sherwin-Williams: Pro Industrial Pro Cryl Universal Primer, B66 Series
 - b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
 - 1) Sherwin-Williams: Pro Industrial Acrylic Semi-Gloss, B66 Series

- c. Topcoat: Light industrial coating, exterior, water based, semi-gloss (Gloss Level 5), MPI #163.
 - 1) Sherwin-Williams: Pro Industrial Acrylic Semi-Gloss, B66 Series
- F. Cementitious Composition Board Substrates:
 - 1. Latex over Alkali-Resistant Primer System:
 - a. Prime Coat: Primer, alkali resistant, water based, MPI #3.
 - 1) Sherwin-Williams: Loxon Concrete and Masonry Primer, A24 Series
 - b. Intermediate Coat: Latex, exterior, matching topcoat.
 - 1) Sherwin-Williams: A-100 Exterior Acrylic Latex Gloss, A8 Series
 - c. Topcoat: Latex, exterior semi-gloss (Gloss Level 5), MPI #11.
 - 1) Sherwin-Williams: A-100 Exterior Acrylic Latex Gloss, A8 Series
- G. Exterior Plastic (PVC) Board Substrates:
 - 1. Latex System:
 - a. Primer, Bonding, Water Based: MPI #17.
 - 1) Sherwin-Williams: Extreme Bond Primer, B51 Series
 - b. Intermediate Coat: Latex, exterior, matching topcoat.
 - 1) Sherwin-Williams: A-100 Exterior Acrylic Latex Gloss, A8 Series
 - c. Topcoat: Latex, exterior semi-gloss (Gloss Level 5), MPI #11.
 - 1) Sherwin-Williams: A-100 Exterior Acrylic Latex Gloss, A8 Series

END OF SECTION 09 91 13

END OF SECTION

SECTION 09 91 23 - INTERIOR PAINTING

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes surface preparation and the application of paint systems on interior substrates.
 - 1. Wood
 - 2. Gypsum Board

1.02 DEFINITIONS

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523. A traditional matte finish, Flat.
- B. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523. A high side sheen flat, "a velvet like" finish.
- C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523. A traditional "egg-shell like" finish.
- D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523. A "satin-like" finish.
- E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523. A traditional semi gloss.
- F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523. A traditional gloss.
- G. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523. A high gloss.

1.03 SUBMITTALS

- A. Action Submittals
 - 1. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all items under this specification section in one submittal for review. Do not include products specified in other specification sections.
 - 2. Product Data: For each type of product. Include preparation requirements and application instructions. For each product, highlight all model numbers, features, and accessories to be provided.
 - 3. Samples: For each type of paint system and in each color and gloss of topcoat.
- B. Maintenance Material Submittals
 - 1. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - a. Paint: 5 percent, but not less than 1 gal. of each material and color applied.
 - 2. Maintenance Data: Submit coating maintenance manual including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (SDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

1.04 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
 - b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Products: Subject to compliance with requirements, comply with the following manufacturer:
 1. Basis of Design: Sherwin-Williams Co.
 2. Benjamin Moore
 3. PPG

2.02 PAINT GENERAL

- A. MPI Standards: Unless otherwise specified provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
- B. Material Compatibility:
 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 1. Flat Paints and Coatings: 50 g/L
 2. Nonflat Paints and Coatings: 150 g/L
 3. Dry-Fog Coatings: 400 g/L
 4. Primers, Sealers, and Undercoaters: 200 g/L
 5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L
 6. Zinc-Rich Industrial Maintenance Primers: 340 g/L
 7. Pretreatment Wash Primers: 420 g/L
 8. Floor Coatings: 100 g/L
 9. Shellacs, Clear: 730 g/L
 10. Shellacs, Pigmented: 550 g/L
- D. Low-Emitting Materials: Interior paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- E. Colors: As indicated on drawings.

2.03 PRIMERS/SEALERS

- A. Primer Sealer, Latex, Interior: MPI #50
 1. Sherwin-Williams: ProMar 200 Zero VOC Interior Latex Primer, B28 Series
- B. Primer, Latex, for Interior Wood: MPI #39
 1. Sherwin-Williams: Premium Wall and Wood Interior Latex Primer, B28 Series
- C. Primer, Bonding, Water Based: MPI #17
 1. Sherwin-Williams: Extreme Bond Primer, B51 Series
- D. Primer, Alkali resistant, water based, MPI #3
 1. Sherwin-Williams: Loxon Concrete and Masonry Primer, A24 Series

- E. Primer, Block Filler, Latex, Interior/Exterior, MPI #4
 - 1. Sherwin-Williams: PrepRite Interior/Exterior Block Filler, B25 Series
- F. Wood-Knot Sealer: Primer Sealer, Alkyd Interior, MPI #45
 - 1. Sherwin-Williams: ProBlock Interior Oil-Based Primer, B79 Series

2.04 WATER-BASED PAINTS

- A. Latex, Interior, (MPI Gloss Level 3): MPI #52
 - 1. Sherwin-Williams: ProMar 200 Zero VOC Interior Latex Eg-shel, B20 Series
- B. Latex, Interior, Semi-Gloss (MPI Gloss Level 5): MPI #54
 - 1. Sherwin-Williams: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31 Series

2.05 FIRE/SMOKE RATE WALLS

- A. Provide a stenciled note above ceiling at all walls indicated to resist the passage of smoke. The note shall read "SMOKE RESISTANT WALL-PROTECT ALL OPENINGS." Notes shall be located within 15 feet of the end of each wall and at intervals not exceeding 30 feet measured horizontally along the wall. Lettering shall be not less than 3" in height and have minimum 3/8" stroke in a contrasting color to the wall. Notes are not required where there is no ceiling.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent
 - 2. Masonry (Clay and CMU): 12 percent
 - 3. Wood: 15 percent
 - 4. Gypsum Board: 12 percent
 - 5. Plaster: 12 percent
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.02 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

3.03 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.04 CLEANING AND PROTECTION

- A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.05 INTERIOR PAINTING SCHEDULE

A. CMU:

1. High-Performance Architectural Latex System:

- a. Prime Coat: Block Filler, Latex, Interior/Exterior, MPI #4.
 - 1) Sherwin-Williams: PrepRite Interior/Exterior Block Filler, B25 Series
- b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
 - 1) Sherwin-Williams: Pro Industrial Pre Catalyzed Waterbased Epoxy Semi-Gloss, K46 Series
- c. Topcoat: Latex, interior, high performance architectural, semi-gloss (Gloss Level 5), MPI #141.
 - 1) Sherwin-Williams: Pro Industrial Pre Catalyzed Waterbased Epoxy Semi-Gloss, K46 Series

B. Steel Substrates: Handrails, high traffic doors

1. Water-Based Light Industrial Coating System:

- a. Coat: Primer, rust-inhibitive, water based MPI #107.
 - 1) Sherwin-Williams: Pro Industrial Pro Cryl Universal Primer, B66 Series
- b. Intermediate Coat: Epoxy-Modified Latex, Interior, Gloss (MPI Gloss Level 6): MPI #115.
 - 1) Sherwin-Williams: Pro Industrial Waterbased Catalyzed Epoxy Gloss, B73 Series
- c. Topcoat: Epoxy-Modified Latex, Interior, Gloss (MPI Gloss Level 6): MPI #115.
 - 1) Sherwin-Williams: Pro Industrial Waterbased Catalyzed Epoxy Gloss, B73 Series

C. Wood Substrates: Including wood trim doors wood-based panel products

1. High-Performance Architectural Latex System:

- a. Prime Coat: Primer, latex, for interior wood, MPI #39.
 - 1) Sherwin-Williams: Premium Wall and Wood Interior Latex Primer, B28 Series
- b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
 - 1) Sherwin-Williams: Pro Industrial Pre Catalyzed Waterbased Epoxy Semi-Gloss, K46 Series
- c. Topcoat: Latex, interior, high performance architectural, semi-gloss (Gloss Level 5), MPI #141.
 - 1) Sherwin-Williams: Pro Industrial Pre Catalyzed Waterbased Epoxy Semi-Gloss, K46 Series

D. Fiberglass and Plastic Substrates:

1. High-Performance Architectural Latex System:

- a. Prime Coat: Primer, bonding, water based, MPI #17
 - 1) Sherwin-Williams: Extreme Bond Primer, B51 Series

- b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
 - 1) Sherwin-Williams: Pro Industrial Pre Catalyzed Waterbased Epoxy Semi-Gloss, K46 Series
 - c. Topcoat: Latex, interior, high performance architectural, semi-gloss (Gloss Level 5), MPI #141.
 - 1) Sherwin-Williams: Pro Industrial Pre Catalyzed Waterbased Epoxy Semi-Gloss, K46 Series
- E. Gypsum Board Substrates: For multifamily projects
- 1. Latex System:
 - a. Prime Coat: Primer sealer, latex, interior, MPI #50.
 - 1) Sherwin-Williams: ProMar 200 Zero VOC Interior Latex Primer, B28 Series
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - 1) Sherwin-Williams: ProMar 200 Zero VOC Interior Latex Eg-shel, B20 Series
 - c. Topcoat: Latex, interior, (Gloss Level 3), MPI #52.
 - 1) Sherwin-Williams: ProMar 200 Zero VOC Interior Latex Eg-shel, B20 Series
- F. Fire and Smoke Rated Walls:
- 1. Provide a stenciled note above ceiling at all walls indicated to resist the passage of smoke, are smoke barriers, or are indicated to be fire rated.
 - 2. The note shall read "FIRE AND/OR SMOKE BARRIER-PROTECT ALL OPENINGS". Notes shall be located within 15 feet of the end of each wall and at intervals not exceeding 30 feet measured horizontally along the wall.
 - 3. Lettering shall be not less than 3" in height and have a minimum 3/8" stroke in a contrasting color to the wall. Notes are not required where there is no ceiling.

END SECTION 09 91 23
END OF SECTION

SECTION 10 14 00 - SIGNAGE

PART 2 PRODUCTS

1.01 SIGNAGE APPLICATIONS

- A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

1.02 SIGN TYPES

- A. Color and Font: Unless otherwise indicated:
 - 1. Character Font: Helvetica, Arial, or other sans serif font.
 - 2. Character Case: Upper case only.
 - 3. Background Color: Clear.
 - 4. Character Color: Contrasting color.

END OF SECTION

SECTION 10 28 00 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Commercial toilet accessories.
- B. Residential toilet, shower, and bath accessories.
- C. Under-lavatory pipe supply covers.
- D. Diaper changing stations.

1.02 RELATED REQUIREMENTS

- A. Section 00 61 00: Placement of reinforcement for backing plate reinforcement.
- B. Section 10 21 13.13 - Metal Toilet Compartments.
- C. Section 22 40 00 - Plumbing Fixtures: Under-lavatory pipe and supply covers.

1.03 REFERENCE STANDARDS

- A. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2022.
- B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.
- C. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2017 (Reapproved 2022).
- D. ASTM C1036 - Standard Specification for Flat Glass; 2021.
- E. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2018.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with the placement of internal wall reinforcement and reinforcement of toilet partitions to receive anchor attachments.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all items under this specification section in one submittal for review. Do not include products specified in other specification sections.
- B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods. For each product, highlight all model numbers, features, and accessories to be provided.
- 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/#sle.
 - 2. Bobrick Washroom Equipment, Inc.: www.bobrick.com
 - 3. Bradley Corporation: www.bradleycorp.com/#sle.
 - 4. Substitutions: Section 01 60 00 - Product Requirements.
- B. Under-Lavatory Pipe Supply Covers:
 - 1. Plumberex Specialty Products, Inc.: www.plumberex.com
 - 2. Substitutions: Section 01 60 00 - Product Requirements.
- C. 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. Keys: Provide 2 keys for each lockable accessory to Owner; master key lockable accessories.
- C. Stainless Steel Sheet: ASTM A666, Type 304.
- D. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.
- 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. Chrome/Nickel Plating: ASTM B456, SC 2, polished finish, unless otherwise noted.

2.04 Commercial Toilet Accessories

- A. Provide commercial toilet accessories as indicated on the drawings.

2.05 Residential Toilet, Shower, and Bath Accessories

- A. Provide residential toilet accessories as indicated on the drawings.
- B. Toilet Paper Dispenser: Double roll, surface mounted, for coreless type rolls.
 - 1. Paper Towel Dispenser: Folded paper type, stainless steel, semi-recessed, with viewing slots on sides as refill indicator and tumbler lock.
 - a. Capacity: 300 C-fold minimum.
 - 2. Waste Receptacle: Stainless steel, freestanding style with swing top.
 - 3. Soap Dispenser: Liquid soap dispenser, wall-mounted, surface, with stainless steel cover and horizontal stainless steel tank and working parts; push type soap valve, check valve, and window gauge refill indicator, tumbler lock.
 - 4. Mirrors: Stainless steel framed, 1/4 inch thick annealed float glass; ASTM C1036.
 - 5. Grab Bars: Stainless steel, smooth surface.
 - a. Standard Duty Grab Bars:
 - 1) Push/Pull Point Load: 250 pound-force, minimum.
 - 2) Length and Configuration: As indicated on drawings.

2.06 UNDER-LAVATORY PIPE AND SUPPLY COVERS

- A. Specified in 22 40 00 - Plumbing Fixtures.
- B. Under-Lavatory Pipe and Supply Covers:
 - 1. Insulate exposed drainage piping including hot, cold, and tempered water supplies under lavatories or sinks to comply with ADA Standards.
 - 2. Color: White.
 - 3. Fasteners: Reusable, snap-locking fasteners with no sharp or abrasive external surfaces.
 - 4. Products:
 - a. Plumberex Specialty Products, Inc; Plumberex Handy-Shield Maxx:
www.plumberex.com
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.

- C. For electrically-operated accessories, verify that electrical power connections are ready and in the correct locations.
- D. Verify that field measurements are as indicated on product data.
- E. See Section 06 10 00 for installation of blocking, reinforcing plates, and concealed anchors in walls.

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.
- D. Mounting Heights: As indicated on the drawings.

3.04 PROTECTION

- A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION

SECTION 11 30 13 - RESIDENTIAL APPLIANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Kitchen appliances.
- B. Laundry appliances.

1.02 RELATED REQUIREMENTS

- A. Section 22 10 05 - Plumbing Piping: Plumbing connections for appliances.
- B. Section 26 05 83 - Wiring Connections: Electrical connections for appliances.

1.03 REFERENCE STANDARDS

- A. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all items under this specification section in one submittal for review. Do not include products specified in other specification sections.
- B. Product Data: Manufacturer's data indicating dimensions, capacity, and operating features of each piece of residential equipment specified. For each product, highlight all model numbers, features, and accessories to be provided.
- C. Copies of Warranties: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Electric Appliances: Listed and labeled by UL (DIR) and complying with NEMA Standards (National Electrical Manufacturers Association).

1.06 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide five (5) year manufacturer warranty on refrigeration system of refrigerators.

PART 2 PRODUCTS

2.01 KITCHEN APPLIANCES

- A. Provide Equipment Eligible for Energy Star Rating: Energy Star Rated.
- B. Refrigerator, ADA Compliant: Free-standing, bottom-mounted freezer, and frost-free.
 - 1. Capacity: Total minimum storage of 18 cubic ft; minimum 15 percent freezer capacity.
 - 2. Energy Usage: Minimum 20 percent more energy efficient than energy efficiency standards set by U.S. Department of Energy (DOE).
 - 3. Features: Include glass shelves, automatic icemaker, and light in freezer compartment.
 - 4. Exterior Finish: Stainless steel, color as indicated.
 - 5. Basis of Design: GE Model #GBE21KFS
- C. Warming Drawer: Electric.
 - 1. Size: 30 inches wide.
 - 2. Oven: Self-cleaning.
 - 3. Controls: Solid state electronic.
 - 4. Features: Include oven light.
 - 5. Exterior Finish: Stainless Steel.
 - 6. Basis of Design: GE Model #PTW9000SPSS

2.02 LAUNDRY APPLIANCES

- A. Provide Equipment Eligible for Energy Star Rating: Energy Star Rated.
- B. Minimum one set of Laundry Equipment to be ADA-compliant

1. All Laundry Equipment to be provided by owner, contractor installed.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify utility rough-ins are provided and correctly located.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Anchor built-in equipment in place.

3.03 ADJUSTING

- A. Adjust equipment to provide efficient operation.

3.04 CLEANING

- A. Remove packing materials from equipment and properly discard.
- B. Wash and clean equipment.

END OF SECTION

SECTION 12 21 13 - HORIZONTAL LOUVER BLINDS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Horizontal slat louver blinds.
- B. Operating hardware.

1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Concealed wood blocking for attachment of headrail brackets.

1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Horizontal Louver Blinds Without Side Guides:
 - 1. Hunter Douglas Architectural; CD Model: www.hunterdouglasarchitectural.com/#sle.
 - 2. Levolor; Metal Blinds: www.levolor.com/commercial/#sle.
 - 3. SWFcontract, a division of Spring Window Fashions, LLC: www.swfcontract.com/#sle.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that openings are ready to receive the work.
- B. Ensure structural blocking and supports are correctly placed. See Section 06 10 00.

3.02 INSTALLATION

- A. Install blinds in accordance with manufacturer's instructions.
- B. Secure in place with flush countersunk fasteners.

3.03 ADJUSTING

- A. Adjust blinds for smooth operation.

3.04 CLEANING

- A. Clean blind surfaces just prior to occupancy.

END OF SECTION

SECTION 12 21 16 - VERTICAL LOUVER BLINDS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Vertical louver blinds at windows.

1.02 REFERENCE STANDARDS

- A. WCMA A100.1 - Standard for Safety of Window Covering Products; 2022.
- B. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2023, with Errata.

1.03 SUBMITTALS

- A. See Section 01 30 00 - 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. Installation methods.
- C. Certification: Provide certification that product complies with WCMA A100.1.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. If blinds are delivered early and stored at the project, deliver in unopened containers; handle and store in such a manner to protect them from damage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Vertical Louver Blinds:
 - 1. Hunter Douglas: www.hunterdouglas.com
 - 2. Levolor; Vertical Blinds: www.commercial.levolor.com
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 BLINDS AND BLIND COMPONENTS

- A. Vertical Louver Blinds: Horizontal travel, vertical vane louver units complete with tracks, pivot and traversing mechanisms, and accessories, as follows:
 - 1. Vanes: PVC, 3-1/2" vanes.
 - 2. Operation: Manual.
 - 3. Direction of Travel: As indicated on the drawings.
 - 4. Mounting: Inside (between jambs).
 - 5. Cord and Chain Operation: Comply with WCMA A100.1.
- B. Tracks: Channel tracks as required for type of operation, extruded aluminum with clear anodized finish, with end caps.
 - 1. Vane Rotation: Chain driven direct rotation by activating tilt gear within end cap assembly in turn actuating tilt rod and worm-and-spur gears in carrier trucks.
 - 2. Operating Components: Internally mounted heavy-duty extruded aluminum tilt rod, vane carriers, and other components required for proper performance and designed for smooth, quiet, trouble free operation.
 - 3. Pivot Mechanism: Geared for synchronous 180 degrees rotation of vanes and type of operation indicated.
 - 4. Vane Carriers: Metal carriers with ball-bearing wheels or thermoplastic trucks, equipped with linkages or other devices to ensure positive spacing of vanes.
 - 5. Tilt Chain: Nickel plated brass beaded ball chain, minimum 1/8 inch diameter; locate at drawback side of units as indicated.

- C. PVC Vanes: Integrally colored, extruded PVC; flat, 2 inches (50mm) wide.
 - 1. Flammability: Comply with NFPA 701.
 - 2. Texture: Smooth.
- D. Brackets and Mounting Hardware: As recommended by manufacturer for the mounting configuration and span indicated; provide manufacturer's standard L- bracket with clip for outside mounting and clip only for inside mounting.

2.03 FABRICATION

- A. Field measure finished openings prior to ordering or fabrication.
- B. Fabricate blinds to fit openings within specified tolerances.
 - 1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch space between bottom of vanes and finish floor.
 - 2. Horizontal Dimensions - Inside Mounting: Fill openings from jamb to jamb.
- C. Dimensional Tolerances: Fabricate blinds to within plus/minus 1/8 inch of intended dimensions.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not start installation before openings are finished and all finishes have been completed; do not install until painting is completed.
- B. Examine finished openings for deficiencies that may preclude satisfactory installation.
- C. Field measure finished openings prior to ordering or fabrication.

3.02 PREPARATION

- A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions using mounting style as indicated.
- B. Installation Tolerances:
 - 1. Maximum Offset From Level: 1/16 inch.
- C. Adjust blinds for smooth operation.
- D. Replace blinds that exceed specified dimensional tolerances at no extra cost to Owner.

3.04 CLEANING

- A. Clean installed work to like-new condition.

3.05 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

SECTION 12 35 30 - RESIDENTIAL CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Kitchen cabinets.
- B. Kitchen countertops.

1.02 RELATED REQUIREMENTS

- A. Section 07 92 00 - Joint Sealants: Sealing joints between casework and countertops and adjacent walls, floors, and ceilings.
- B. Section 12 36 00 - Countertops.

1.03 REFERENCE STANDARDS

- A. ANSI A208.1 - American National Standard for Particleboard; 2022.
- B. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2020.
- C. KCMA A161.1 - Performance and Construction Standard for Kitchen and Vanity Cabinets; 2017.
- D. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all items under this specification section in one submittal for review. Do not include products specified in other specification sections.
- B. Product Data: Provide component dimensions, configurations, construction details, and joint details. For each product, highlight all model numbers, features, and accessories to be provided.
- C. Certificate: Submit Kitchen Cabinet Manufacturers Association (KCMA) certificate showing conformance with KCMA A161.1. Provide documentation of cabinet product's HUD Severe Use Certification.
- D. Certificate: Submit Kitchen Cabinet Manufacturers Association (KCMA) certificate showing manufacturer has met the requirements of KCMA's Environmental Stewardship Program (ESP).
- E. Shop Drawings: Indicate casework locations, elevations, clearances required, rough-in and anchor placement dimensions and tolerances.
- F. Cabinet Finish Sample: Submit two samples of each type of finish, minimum 2 inches by 3 inches in size, illustrating color, texture, gloss, and wood species.
- G. Manufacturer's Qualification Statement.
- H. Specimen Warranty.

1.05 QUALITY ASSURANCE

- A. Products: Cabinets complying with requirements of KCMA's Environmental Stewardship Program (ESP).
- B. Manufacturer: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

1.06 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Provide a lifetime warranty on drawers, drawer guides, and hinges. Provide five year manufacturer warranty for cabinets and all other components.

PART 2 PRODUCTS

2.01 Cabinets

- A. Manufacturers:
 - 1. Kountry Wood Products ; www.kountrywood.com.
 - 2. Smart Cabinetry; www.smartcabinetry.com
 - 3. Merrilat Cabinetry; www.merrilat.com
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.
 - B. Kitchen Cabinets: Premanufactured and factory-finished, complying with construction and testing requirements in KCMA A161.1. Cabinets to be **HUD Severe Use Certified**.
 - C. Cabinet Box: Manufacturer's standard materials and construction as determined by selected product line.
 - D. Cabinet Box: Framed construction.
 - 1. Side Panels: Plywood.
 - a. Exposed Side Panel Finish: Wood veneer, coordinate with cabinet door and drawer color/finish.
 - 2. Back Panel: Plywood.
 - 3. Bottom (and Top) Panel: Plywood.
 - 4. Face Frame: Solid wood.
 - 5. Exposed Panel Edges: Finish with manufacturer's standard edge banding, color coordinated with other exposed finishes.
 - E. Cabinet Door/Drawer Configuration: Partial overlay.
 - F. Cabinet Doors:
 - 1. Solid wood, stained finish.
 - 2. Style/Color: as indicated on drawings.
 - G. Drawers:
 - 1. Solid wood sides with dovetail joints, plywood bottom panel.
 - 2. Drawer Front: To match cabinet doors in style, material, and finish.
 - 3. Interior Finish: Manufacturer's standard.
 - H. Shelves: Manufacturer's standard adjustable shelves and shelf supports.
 - I. Cabinet Hardware: As selected from manufacturer's standard types, styles and finishes.
 - 1. Drawer and Cabinet Pulls: Basis of Design: Mockett DP57 Series.
 - 2. Hinges: Manufacturer's standard self-closing concealed hinges.
 - 3. Drawer Slides: Manufacturer's standard self-closing drawer slides.
 - J. Countertops: As specified in Section 12 36 00.
 - K. Cabinetry shall comply with all state housing authorities.
 - L. Kitchen Countertop: Post formed plastic laminate over particle board, coved to back splash.
 - 1. Side Splash: Plastic laminate over particle board, square internal intersections to back splash and top surface, contoured to suit counter top profile.
 - M. Bolts, Nuts, Washers and Screws: Of size and type to suit application.
- 2.02 MATERIALS
- A. Wood-Based Materials:
 - 1. Certified as sustainably harvested as specified in Section 01 60 00.
 - 2. Solid Wood: Air-dried to 4.5 percent moisture content, then tempered to 6 percent moisture content before use.
 - 3. Composite Wood Panels: Containing no urea-formaldehyde resin binders.
 - B. Solid Wood: Clear, dry, sound, plain sawn, selected for species grain and color, no defects.
 - C. Hardwood Plywood: Veneer core; HPVA HP-1 Grade as indicated; same species as exposed solid wood, clear, compatible grain and color, no defects. Band exposed edges with solid wood

of same species as veneer.

- D. Particleboard: Composed of wood chips, medium density, with waterproof resin binders; of grade to suit application; sanded faces; complying with ANSI A208.1.
- E. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications. complying with Grade requirements, and standard with the manufacturer.

2.03 FABRICATION

- A. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
- B. Fabricate corners and joints without gaps.
- C. Fabricate each unit to be rigid and not dependent on adjacent units for rigidity.
- D. Provide cutouts for plumbing fixtures and appliances. Prime paint contact surfaces of cut edges.
- E. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of support framing.

3.02 INSTALLATION

- A. Install casework, components and accessories in accordance with manufacturer's instructions.
- B. Use anchoring devices to suit conditions and substrate materials encountered.
- C. Set casework items plumb and square, securely anchored to building structure.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch.

3.03 ADJUSTING

- A. Adjust doors, drawers, hardware, and other moving or operating parts to function smoothly.

3.04 CLEANING

- A. Clean casework, countertops, shelves, and hardware.

3.05 PROTECTION

- A. Do not permit finished casework to be exposed to continued construction activity.

END OF SECTION

SECTION 12 36 00 - COUNTERTOPS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Countertops for architectural cabinet work.
- B. Countertops for manufactured casework.
- C. Wall-hung counters and vanity tops.
- D. Sinks molded into countertops.

1.02 RELATED REQUIREMENTS

- A. Section 06 41 00 - Architectural Wood Casework.
- B. Section 12 35 30 - Residential Casework.
- C. Section 22 40 00 - Plumbing Fixtures: Sinks.

1.03 REFERENCE STANDARDS

- A. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.
- B. ISFA 3-01 - Classification and Standards for Quartz Surfacing Material; 2013.
- C. MIA (DSDM) - Dimensional Stone Design Manual, Version VIII; 2016.
- D. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
- E. ANSI Z 124.3- Plastic Lavatories
- F. ASTM E84- Standard Test Method for Surface Buring Characteristis of Building Materials.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all items under this specification section in one submittal for review. Do not include products specified in other specification sections.
- B. Product Data: Manufacturer's data sheets on each product to be used, including the below. For each product, highlight all model numbers, features, and accessories to be provided.
 - 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 6 inches square, representing actual product, color, and patterns. For each product, highlight all model numbers, features, and accessories to be provided.
- E. Test Reports: Chemical resistance testing, showing compliance with specified requirements.
- F. Installation Instructions: Manufacturer's installation instructions and recommendations.
- G. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.05 QUALITY ASSURANCE

- A. 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. Manufacturers

1. Wilsonart; www.wilsonart.com
2. Pionite; www.pionite.com
3. Formica; www.formica.com
4. Laminate Sheet
 - a. Manufacturers:
 - 1) Formica Corporation; Formica High Pressure Laminate: www.formica.com.
 - 2) Panolam Industries International, Inc; Nevamar Standard HPL: www.panolam.com.
 - 3) Wilsonart; High Pressure Laminate: www.wilsonart.com.
 - b. Back and End Splashes: Same material, same construction.
 - c. Fabricate in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 11 - Countertops, Custom Grade.
 - d. Standard Decorative Laminate
 - 1) Enhanced Laminate Performance: Fabricate laminate with Enhanced Performance Technology for increased surface wear resistance and surface abrasion
 - 2) General Purpose Laminate Product
 - (a) Sheet Thickness: 0.048 inch nominal.
 - (b) Color, Pattern and Finish: as indicated on drawings
 - 3) Post Forming Laminate Product (Type 350)
 - (a) Sheet Thickness: 0.039 inch nominal
 - (b) Color, Pattern and Finish: as indicated on drawings
 - e. High Definition Laminates
 - 1) Enhanced Laminate Performance: Fabricate laminate with Enhanced Performance Technology for increased surface wear resistance and surface abrasion
 - 2) Sheet Thickness: 0.39 inch nominal
 - 3) Color, Pattern and Finish: as indicated on drawings
 - f. High Wear Decorative Laminates
 - 1) Enhanced Laminate Performance: Fabricate laminate with Enhanced Performance Technology for increased surface wear resistance and surface abrasion
 - 2) Sheet Thickness: 0.048 inch nominal
 - 3) Color, Pattern and Finish: as indicated on drawings
 - g. Edge Banding
 - 1) Thickness: Refer to Manufacturer's Tech Data Sheet
 - 2) Color, Pattern and Finish: as indicated on drawings
5. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.
 - a. Flat Sheet Thickness: 1/2 inch, minimum.
 - b. 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.

- 1) Manufacturers:
 - (a) Dupont: www.corian.com
 - (b) Formica Corporation: www.formica.com
 - (c) Wilsonart: www.wilsonart.com
 - (d) Hanex; www.hanexsolidsurfaces.com
- 2) Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
- 3) Color and Pattern: As indicated on drawings.
- c. Other Components Thickness: 1/2 inch, minimum.
- d. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
6. Natural Quartz and Resin Composite Countertops: Sheet or slab of natural quartz and plastic resin over continuous substrate.
 - a. Flat Sheet Thickness: 1-1/4 inch, minimum.
 - b. Natural Quartz and Resin Composite Sheets, Slabs and Castings: Complying with ISFA 3-01 and NEMA LD 3; orthophthalic 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.
 - 1) Manufacturers:
 - (a) Wilsonart: www.wilsonart.com.
 - (b) Cambria; www.cambria.com.
 - (c) Hanstone; www.hanstonequartz.com
 - 2) Factory fabricate components to the greatest extent practical in sizes and shapes indicated; comply with the MIA Dimension Stone Design Manual.
 - 3) Finish on Exposed Surfaces: Polished.
 - 4) Color and Pattern: As indicated on drawings.
 - 5) Edge Detail: As indicated on drawings.
 - c. Other Components Thickness: 3/4 inch, minimum.
 - d. Exposed Edge Treatment: Built up to minimum 1-1/4 inch thick; square edge; use marine edge at sinks.
 - e. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
7. Cultured Marble with Integral Bowl Sink
 - a. Manufacturers:
 - 1) U. S. Marble, Inc.; www.usmarble.com
 - 2) Lippert Cultured Marble; www.lippertculturedmarble.com
 - 3) Rynone Manufacturing Corp; www.rynone.com
 - b. Minimum Thickness: 3/4 inch throughout vanity top deck and bowl.
 - c. Vanity Tops
 - 1) Depth: 22 inches, as indicated on drawings
 - 2) Length: as indicated on drawings
 - d. Bowls:
 - 1) Type: Single, Double, or Triple
 - 2) Style: Oval, Rectangle, Square
 - 3) Size: 19" x 17"
 - 4) Offset: As indicated on drawings.
 - 5) Overflow Holes: 1/2 inch od pvc overflow hose permanently installed in integral overflow drain.

- 6) Faucet Holes: Coordinate with plumbing. Drill holes for plumbing fixtures in shop.
- e. Backsplashes: 4 inch high, integral or separate backsplash. Provide at all locations where countertop abuts a wall.
- f. Edges: Flat deck, 3/4 inch bullnose, Beveled, Ogee
- g. Edges at Sink:
- h. Color: As indicated on drawings.
- i. Finish: As indicated on drawings.

2.02 FABRICATION

- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
 - 1. Join lengths of tops using best method recommended by manufacturer.
 - 2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
 - 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
 - 1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
 - 2. Height: 4 inches, unless otherwise indicated.
- C. Solid Surfacing: Fabricate tops up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.
 - 1. Integral sinks: Shop-mount securely to countertop with adhesives, using flush configuration, as per manufacturer's instructions, and as detailed on drawings.
- D. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings, finished to match.

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. Make field cuts as necessary from unfinished bottom side in accordance with manufacturer's instructions.
- C. Attach separate backsplashes and side splashes to countertops in accordance with manufacturer's instructions.
- D. Do not excessively tighten faucet fixtures or sink drains on countertops or vanities. Hand tighten sink drains in accordance with manufacturer's instructions.

- E. Repair nicks, scratches and other minor damages to finish in accordance with manufacturer's instructions and as approved by architect.
- F. Remove and replace damaged units that can not be successfully repaired as determined by Architect.

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.
- B. Clean and polish engineered composite units promptly after installation in accordance with manufacturer's instructions.
- C. Do not use abrasive or harsh cleaning materials or methods that would damage finish.

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

SECTION 22 05 00 - COMMON WORK RESULTS FOR PLUMBING

PART 1 GENERAL

1.01 SCOPE OF WORK FOR PLUMBING

- A. Contractor shall provide all labor, materials, equipment, permits, inspection fees, utility company charges, supervision and other items noted in contract General Conditions necessary to yield completely operable and tested systems as indicated on the plans and specified herein. The work includes, but is not limited to, the following areas:
 - 1. Building plumbing systems:
 - a. Demolition of existing systems as indicated on drawings.
 - b. Sanitary drain, waste, and vent systems from all points of discharge and connections to existing system.
 - c. Domestic hot and cold water systems from source to all points of use and chlorination of systems prior to occupancy.
 - d. Plumbing fixtures and trim, floor drains, cleanouts and related items.
 - 2. Plumbing piping and equipment insulation as specified.
- B. Cleanup associated with work of respective trades.
- C. No asbestos or mercury containing materials, materials capable of discharging lead into potable water or air systems, or materials capable of releasing other hazardous substances to the facility air environment, drainage systems, or water systems shall be used.
- D. Equipment schedules are provided as a convenience to the Contractor, but do not relieve him of his responsibility to furnish all items shown on the plans and indicated in the specifications.
- E. All equipment furnished and installed shall comply with the relevant agency listing, testing, and labeling requirements of the Michigan Mechanical Code and the Michigan Plumbing Code.
- F. Coordination with other trades. Contractor shall assist in the field layout and coordination of equipment, ductwork, and piping installation and their relation with other trades at no additional cost to the owner.
- G. Touch-up painting of damaged materials furnished by this contractor and damaged by this contractor. Each mechanical contractor shall be responsible for replacement/patching of all finish materials which have been disrupted and/or damaged as a result of their construction procedures. All materials shall match original and all work shall be done by experienced field tradesmen
- H. One year labor and equipment guarantee on completed installation.
- I. Job Site safety is the responsibility of the contractor. The architect/engineer bears no responsibility for job-site safety.
- J. Owner training in operation and maintenance of installed equipment and systems. Using the Operating and Maintenance manuals, balancing report data, and construction plans and specifications, contractor shall instruct owner's representatives in the proper operation of the equipment and systems installed to their mutual satisfaction. This activity shall take place near the point of substantial completion and will be considered one of the final punch list issues. Training shall consist of a period of "classroom" instruction providing a general overview of the facility equipment and systems plus a tour of the facility and its equipment pointing out specific maintenance issues for each area and item of equipment. When the training is complete owner shall be provided with a training certificate by the contractor by which the owner will acknowledge that such training has taken place.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

Lucas Metropolitan Housing
LMHA Task Order #2 - Richmar Manor
Issuance - PERMIT REVISIONS
END OF SECTION

Hooker DeJong, Inc.
2019.0072
Issued: 2024.1.29

SECTION 22 07 19 - PLUMBING PIPING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Piping insulation.

1.02 RELATED REQUIREMENTS

- A. Section 07 84 00 - Firestopping.
- B. Section 22 10 05 - Plumbing Piping: Placement of hangers and hanger inserts.
- C. Section 23 23 00 - Refrigerant Piping: Placement of inserts.

1.03 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 C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement; 2007 (Reapproved 2019).
- C. ASTM C449 - Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement; 2007 (Reapproved 2019).
- D. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.
- E. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2023.
- F. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation; 2022a.
- G. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation; 2022.
- H. ASTM C1410 - Standard Specification for Cellular Melamine Thermal and Sound-Absorbing Insulation; 2017 (Reapproved 2023).
- I. ASTM C1695 - Standard Specification for Fabrication of Flexible Removable and Reusable Blanket Insulation for Hot Service; 2022.
- J. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2019.
- K. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2022a, with Editorial Revision (2023).

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.
- C. Manufacturer's Instructions: Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.07 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 ASTM E84.

2.02 GLASS FIBER

- A. Manufacturers:
 - 1. Knauf Insulation: www.knaufusa.com.
 - 2. Johns Manville Corporation: www.jm.com.
 - 3. Owens Corning Corp: www.owenscorning.com.
 - 4. Substitutions: See Section 01 60 00 - 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-inches.

2.03 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

- A. Manufacturer:
 - 1. Aeroflex USA, Inc: www.aeroflexusa.com
 - 2. Armacell LLC: www.armacell.us
 - 3. K-Flex USA LLC: www.kflexusa.com
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1; use molded tubular material wherever possible.
 - 1. Minimum Service Temperature: Minus 40 degrees F.
 - 2. Maximum Service Temperature: 220 degrees F.
 - 3. Connection: Waterproof vapor barrier adhesive.
- C. Elastomeric Foam Adhesive: Air dried, contact adhesive, 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. Install in accordance with North American Insulation Manufacturers Association (NAIMA) National Insulation Standards.
- C. Exposed Piping: Locate insulation and cover seams in least visible locations.
- D. Glass fiber insulated pipes conveying fluids above ambient temperature:
 - 1. Provide standard jackets, with or without vapor barrier, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples.
 - 2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
- E. Inserts and Shields:
 - 1. Application: Piping 1-1/2 inches diameter or larger.
 - 2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.

3. Insert Location: Between support shield and piping and under the finish jacket.
 4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
 5. Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.
- F. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, refer to Section 07 84 00.
- G. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet above finished floor): Finish with PVC jacket and fitting covers.
- H. Buried Piping: Provide factory fabricated assembly with inner all-purpose service jacket with self-sealing lap, and asphalt impregnated open mesh glass fabric, with one mil thick aluminum foil sandwiched between three layers of bituminous compound; outer surface faced with a polyester film.

3.03 SCHEDULES

- A. Plumbing Systems:
1. Domestic Hot Water Supply:
 - a. Pipe Size Range: Up to 1-1/2 inch
 - 1) Thickness: 1 inch
 - 2) Material: flexible elastomeric cellular insulation
 2. Domestic Cold Water: metallic pipe, braided hoses and fittings:
 - a. Pipe Size Range: Up to 1-1/2 inch
 - 1) Thickness: 1/2 inch
 - 2) Material: flexible elastomeric cellular insulation

END OF SECTION

SECTION 22 10 05 - PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Pipe, pipe fittings, specialties, and connections for piping systems.
 - 1. Sanitary sewer.
 - 2. Domestic water.
 - 3. Flanges, unions, and couplings.
 - 4. Pipe hangers and supports.
 - 5. Valves.

1.02 RELATED REQUIREMENTS

- A. Section 07 84 00 - Firestopping.
- B. Section 08 31 00 - Access Doors and Panels.
- C. Section 09 91 23 - Interior Painting.
- D. Section 22 07 19 - Plumbing Piping Insulation.
- E. Section 33 01 10.58 - Disinfection of Water Utility Piping Systems.

1.03 REFERENCE STANDARDS

- A. ANSI Z21.22 - American National Standard for Relief Valves for Hot Water Supply Systems; 2015 (Reaffirmed 2020).
- B. ANSI Z223.1 - National Fuel Gas Code; 2021.
- C. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2021.
- D. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2021.
- E. ASSE 1003 - Water Pressure Reducing Valves for Potable Water Distribution Systems; 2023.
- F. ASTM B42 - Standard Specification for Seamless Copper Pipe, Standard Sizes; 2020.
- G. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2020.
- H. ASTM B813 - Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube; 2016.
- I. ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings; 2016.
- J. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2020.
- K. ASTM D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings; 2020.
- L. 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.
- M. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2023.
- N. ASTM F876 - Standard Specification for Crosslinked Polyethylene (PEX) Tubing; 2023a.
- O. ASTM F877 - Standard Specification for Crosslinked Polyethylene (PEX) Hot- and Cold-Water Distribution Systems; 2023.
- P. ASTM F1960 - Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-Linked Polyethylene (PEX) and Polyethylene of Raised Temperature (PE-RT) Tubing; 2023b.
- Q. AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast; 2017, with Errata (2018).

Issuance - PERMIT REVISIONS

Issued: 2024.1.29

- R. ICC-ES AC01 - Acceptance Criteria for Expansion Anchors in Masonry Elements; 2018, with Editorial Revision (2020).
- S. ICC-ES AC106 - Acceptance Criteria for Predrilled Fasteners (Screw Anchors) in Masonry; 2018, with Editorial Revision (2020).
- T. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2017, with Editorial Revision (2020).
- U. ICC-ES AC308 - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements; 2023.
- V. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2018, with Amendment (2019).
- W. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010, with Errata .
- X. NSF 61 - Drinking Water System Components - Health Effects; 2023.
- Y. NSF 372 - Drinking Water System Components - Lead Content; 2022.
- Z. PPI TR-4 - PPI HSB Listing of Hydrostatic Design Basis (HDB), Hydrostatic Design Stress (HDS), Strength Design Basis (SDB), Pressure Design Basis (PDB) and Minimum Required Strength (MRS) Ratings for Thermoplastic Piping Materials or Pipe; 2021.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with applicable codes.
- B. Valves: Manufacturer's name and pressure rating marked on valve body.

1.06 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.

1.07 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 SEWER PIPING, BURIED WITHIN 5 FEET OF BUILDING (FOAM CORE OR COEXTRUDED PVC IS NOT ACCEPTABLE)

- A. PVC Pipe: ASTM D2665 or ASTM D3034.
 - 1. Fittings: PVC.
 - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.03 SANITARY SEWER PIPING, ABOVE GRADE (FOAM CORE OR COEXTRUDED PVC IS NOT ACCEPTABLE)

- A. PVC Pipe: ASTM D2665.
 - 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), Type L (B), Drawn (H).
 - 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
 - 2. Joints: ASTM B32, alloy Sn95 solder.
- B. Cross-Linked Polyethylene Pipe (PEX-A or PEX-B): ASTM F876 or ASTM F877.
 - 1. Manufacturers:
 - a. Uponor, Inc: www.uponorengineering.com/sle.
 - b. Viega LLC: www.viega.com.
 - c. Zurn Industries, LLC: www.zurn.com.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
 - 2. PPI TR-4 Pressure Design Basis:
 - 3. Fittings: Brass and copper.
 - 4. Fittings: Brass and engineered polymer (EP) ASTM F1960.
 - 5. Joints: Mechanical compression fittings.
 - 6. Joints: ASTM F1960 cold-expansion fittings.

2.05 FLANGES, UNIONS, AND COUPLINGS

- A. Unions for Pipe Sizes 3 Inches and Under:
 - 1. Copper tube and pipe: Class 150 bronze unions with soldered joints.

2.06 PIPE HANGERS AND SUPPORTS

- A. Provide hangers and supports that comply with MSS SP-58.
 - 1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
 - 2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
 - 3. Trapeze Hangers: Welded steel channel frames attached to structure.
 - 4. Vertical Pipe Support: Steel riser clamp.
- B. Plumbing Piping - Drain, Waste, and Vent:
 - 1. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
 - 2. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
 - 3. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
- C. Plumbing Piping - Water:
 - 1. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
 - 2. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
- D. Hanger Fasteners: Attach hangers to structure using appropriate fasteners, as follows:
 - 1. Concrete Wedge Expansion Anchors: Complying with ICC-ES AC193.
 - 2. Masonry Wedge Expansion Anchors: Complying with ICC-ES AC01.
 - 3. Concrete Screw Type Anchors: Complying with ICC-ES AC193.
 - 4. Masonry Screw Type Anchors: Complying with ICC-ES AC106.
 - 5. Concrete Adhesive Type Anchors: Complying with ICC-ES AC308.
 - 6. Other Types: As required.

2.07 BALL VALVES

- A. Manufacturers:
 - 1. Grinnell Products, a Tyco Business: www.grinnell.com

2. Nibco, Inc: www.nibco.com
 3. Uponor, Inc: www.uponorengineering.com
 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Construction, 4 Inches and Smaller: MSS SP-110, Class 150, 400 psi CWP, bronze body, 304 stainless steel or chrome plated brass ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, solder, threaded, or grooved ends with union.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that excavations are to required grade, dry, and not over-excavated.

3.02 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- D. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- E. Group piping whenever practical at common elevations.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Refer to Section 22 05 16.
- G. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
- H. Provide access where valves and fittings are not exposed.
1. Coordinate size and location of access doors with Section 08 31 00.
- I. Provide support for utility meters in accordance with requirements of utility companies.
- J. Prepare exposed, unfinished pipe, fittings, supports, and accessories ready for finish painting.
1. Painting of interior plumbing systems and components is specified in Section 09 91 23.
 2. Painting of exterior plumbing systems and components is specified in Section 09 91 13.
- K. Install water piping to ASME B31.9.
- L. 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.
- M. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.
- N. Pipe Hangers and Supports:
1. Install in accordance with ASME B31.9.
 2. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
 3. Place hangers within 12 inches of each horizontal elbow.
 4. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
 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.

3.04 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Disinfect water distribution system in accordance with Section 33 01 10.58.
- B. Prior to starting work, verify system is complete, flushed and clean.
- C. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.

END OF SECTION

SECTION 22 10 06 - PLUMBING PIPING SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Floor drains.
- B. Cleanouts.
- C. Water hammer arrestors.

1.02 RELATED REQUIREMENTS

- A. Section 22 10 05 - Plumbing Piping.
- B. Section 22 40 00 - Plumbing Fixtures.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASME A112.6.3 - Floor Drains; 2022.
- C. NSF 61 - Drinking Water System Components - Health Effects; 2023.
- D. NSF 372 - Drinking Water System Components - Lead Content; 2022.
- E. PDI-WH 201 - Water Hammer Arresters; 2017.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all products into one submittal for review. Do not include products described in other specification sections.
- B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
- C. Shop Drawings: Indicate dimensions, weights, and placement of openings and holes.
- D. Manufacturer's Instructions: Indicate Manufacturer's Installation Instructions: Indicate assembly and support requirements.
- E. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Loose Keys for Outside Hose Bibbs: Two.

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
 - 2. Josam Company: www.josam.com
 - 3. Watts Water Technologies: www.watts.com
 - 4. Zurn Industries, LLC: www.zurn.com
 - 5. Substitutions: See Section 01 60 00 - Product Requirements.
- B. **Floor Drain (FD-1):**
 - 1. Floor drain, polyvinyl chloride body with bottom outlet
 - 2. Vertical adjustability for installation flush with finished floor
 - 3. Strainer: round, heel-proof, polished nickel bronze, light-duty strainer.

4. Pipe Connection: 3"
5. Inline Floor Drain Trap Sealer. 5 pieces: commercial grade ABS plastic housing and keeper pin, neoprene rubber diaphragm, with 2 soft rubber sealing gaskets.

C. Floor Drain (FD-2):

1. Floor drain, polyvinyl chloride body with bottom outlet, with stainless steel deck plate.
2. Vertical adjustability for installation flush with finished floor
3. Strainer: round, heel-proof, polished nickel bronze, light-duty strainer.
4. Pipe Size: 3"
5. Inline Floor Drain Trap Sealer. 5 pieces: commercial grade ABS plastic housing and keeper pin, neoprene rubber diaphragm, with 2 soft rubber sealing gaskets.

2.03 CLEANOUTS

A. Manufacturers:

1. Jay R. Smith Manufacturing Company: www.jayrsmith.com.
2. Josam Company: www.josam.com.
3. Watts Water Technologies: www.watts.com
4. Zurn Industries, LLC: www.zurn.com.
5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Cleanouts at Interior Finished Floor Areas (FCO):

1. PVC body, with and adjustable nickel cover and an ABS taper thread plug. Fits over 3 or inside 4 Sch. 40 DWV pipe.
2. Basis of Design: Zurn Industries: Model CO2451-PVC: www.zurn.com

C. Cleanouts at Interior Finished Wall Areas (WCO):

1. Line type with lacquered cast iron body and round gas and watertight ABS tapered threaded plug, and round stainless steel access cover secured with securing screw.

2.04 WATER HAMMER ARRESTORS

A. Manufacturers:

1. Jay R. Smith Manufacturing Company: www.jayrsmith.com.
2. Watts Regulator Company, a part of Watts Water Technologies: www.wattsregulator.com.
3. Zurn Industries, LLC: www.zurn.com.
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Water Hammer Arrestors:

1. Stainless steel construction, bellows type sized in accordance with PDI-WH 201, precharged suitable for operation in temperature range minus 100 to 300 degrees F and maximum 250 psi working pressure.
2. ANSI 3rd party certified to comply with states' lead plumbing law 0.25% maximum weighted average lead content requirement, consist of a copper body with a low lead brass hexagonal male pipe threaded inlet, an acetal, polycarbonate or low lead brass piston with Buna Nitrile or EPDM o-rings and lead free solder. The device shall be pre-charged and sealed at the factory.
3. Basis of Design: Zurn Industries: Model 1250LX: www.zurn.com

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.

Lucas Metropolitan Housing
LMHA Task Order #2 - Richmar Manor
Issuance - PERMIT REVISIONS

Hooker DeJong, Inc.
2019.0072
Issued: 2024.1.29

END OF SECTION

SECTION 22 40 00 - PLUMBING FIXTURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Water closets.
- B. Lavatories.
- C. Sinks.
- D. Under-lavatory pipe supply covers.
- E. Electric water coolers.

1.02 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary: Owner-furnished fixtures.
- B. Section 06 41 00 - Architectural Wood Casework: Preparation of counters for sinks and lavatories.
- C. Section 07 92 00 - Joint Sealants: Sealing joints between fixtures and walls and floors.
- D. Section 12 36 00 - Countertops: Preparation of counters for sinks and lavatories.
- E. Section 22 10 05 - Plumbing Piping.
- F. Section 22 10 06 - Plumbing Piping Specialties.
- G. Section 22 30 00 - Plumbing Equipment.
- H. Section 26 05 83 - Wiring Connections: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASME A112.18.9 - Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures; 2011 (Reaffirmed 2022).
- C. ASTM C1822 - Standard Specification for Insulating Covers on Accessible Lavatory Piping; 2021.
- D. ASHRAE Std 18 - Methods of Testing for Rating Drinking-Water Coolers with Self-Contained Mechanical Refrigeration; 2008 (Reaffirmed 2013).
- E. ASME A112.18.1 - Plumbing Supply Fittings; 2018, with Errata.
- F. ASME A112.19.2 - Ceramic Plumbing Fixtures; 2018, with Errata.
- G. ASSE 1070 - Performance Requirements for Water Temperature Limiting Devices; 2020.
- H. NSF 61 - Drinking Water System Components - Health Effects; 2023.
- I. NSF 372 - Drinking Water System Components - Lead Content; 2022.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all Plumbing Fixtures in one submittal for review. Do not include products described in other specification sections.
- B. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes. Provide associated symbol with each product cut sheet. Highlight all model numbers, features, and accessories used in job, and indicate which features and accessories will not be included.
- C. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Accept fixtures on site in factory packaging. Inspect for damage. Replace damaged fixture before installation.
- 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 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer warranty for electric water cooler that warrants the compressor and hermetically sealed refrigeration system, including cooling coils and tank assembly.

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. Water Efficiency: EPA WaterSense label is required for all water closets, urinals, lavatory faucets, and showerheads.

2.02 Water Closets

- A. Manufacturers:
 - 1. American Standard, Inc: www.americanstandard-us.com.
 - 2. Gerber Plumbing Fixtures LLC: www.gerberonline.com.
 - 3. Kohler Company: www.kohler.com.
 - 4. Toto Ltd: www.totousa.com.
 - 5. Zurn Industries, Inc: www.zurn.com.
 - 6. Mansfield Plumbing: www.mansfieldplumbing.com.
 - 7. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Floor Mount Floor Discharge Flush Tank Water Closet (**WC-1A**)
 - 1. Bowl and Tank: ASME A112.19.2, floor mounted, vitreous china. Close-coupled closet combination with insulated vitreous china closet tank, fittings, and lever flushing valve.
 - a. ICC **ANSI** A117.1 Compliant
 - b. 16.5 inches high with elongated bowl.
 - c. Supply Size: 1/2 inches.
 - d. Minimum Trapway Size: 2 inches.
 - e. Outlet Size: 3 inches.
 - f. Bolt caps
 - g. Color: White
 - h. 1,000 MaP Score at 1.0 GPF
 - i. Basis of Design: Kohler: Model: Highline Pressure Lite K-3519 www.kohler.com
 - 2. Flush:
 - a. Operation: Trip lever.
 - b. System: Gravity feed, wash down with a consumption of 1.0 GPF.
 - c. WaterSense labeled and certified.
 - 3. Seat:
 - a. Solid white plastic, closed front, extended back, self-sustaining hinge, brass bolts, with cover.
 - 4. Accessories:
 - a. Shutoff valve. Use 1/4-turn ball valve, gate valves are not acceptable.
 - 1) All stops shall utilize threaded or sweat connections on supply-side (inlet to stop). No compression fittings are allowed on the inlet side to the stop.

- 2) Supply kit shall include commercial-grade chrome-plated brass stops with brass stems and handles. No plastic stems or handles. Include chrome-plated copper risers.
- b. Stainless steel flexible supply as manufactured by Watts or Brasscraft are allowed. Inlet and outlet sizes for all supplies shall be 3/8" or 1/2" as needed.
- c. Supply kit shall be certified by a recognized testing authority, marked with the manufacturer's name and shall comply with the SDWA (Safe Drinking Water Act) "No Lead restrictions of ANSI NSF 61 Sec. 9.

2.03 LAVATORIES

A. Lavatory Manufacturers:

1. American Standard, Inc: www.americanstandard-us.com.
2. Gerber Plumbing Fixtures LLC: www.gerberonline.com.
3. Kohler Company: www.kohler.com.
4. Sloan Valve Company: www.sloan.com
5. Zurn Industries, Inc: www.zurn.com.
6. Mansfield Plumbing: www.mansfieldplumbing.com.
7. Substitutions: See Section 01 60 00 - Product Requirements.

B. Wall Hung Lavatory (**LAV-2A**)

1. ASME A112.19.2: white vitreous china, wall hung oval lavatory, 20-1/2 by 18-1/4 inch, with 3 faucet holes on 4 inch centers, front overflow, and faucet ledge.
 - a. ICC **ANSI** A117.1 Compliant
 - b. Basis of Design: American Standard: Model 0335.012: www.americanstandard-us.com
2. Faucet:
 - a. ICC **ANSI** A117.1 Compliant
 - b. ASME A112.18.1: Centerset faucet with single handle and shall be of metal construction.
 - c. 1.0 GPM at 60 psi
 - d. WaterSense labeled and certified
 - e. Metal grid drain
 - f. Basis of Design: Wolverine Brass: model 85260
 - g. Concealed Arm Carrier System: A.R.C. Coated Steel Stanchions with welded feet, steel sleeves, cast iron headers and arms, alignment truss, and mounting bolts and trim.
 - 1) Basis of Design: Zurn Industries, Inc.: Model Z1231: www.zurn.com

C. Accessories:

1. Supply Kits.
 - a. Shutoff valves.
 - 1) Use 1/4-turn ball valves as shutoff valves, gate valves are not acceptable.
 - 2) All stops shall be commercial grade chrome plated brass stops with brass stems and handles. No plastic stems or handles.
 - 3) Risers shall be chrome-plated copper.
 - 4) All stops shall utilize threaded or sweat connections on supply-side (inlet to stop). No compression fittings are allowed on the inlet side of the stop.
 - 5) Loose key stops required for all exposed areas. Handle stops are acceptable under sinks and/or lavatories located in cabinetry.

- 6) Acceptable manufacturers are Brasscraft, Keeney, McGuire, Watts, and Zurn, all commercial grades.
 - b. Inlet and outlet sizes for all supplies shall be 3/8" or 1/2" as needed.
 - c. Stainless steel flexible supplies as manufactured by Watts or Brasscraft are allowed.
 - d. Supply kit shall be certified by a recognized testing authority, marked with the manufacturer's name and shall comply with the SDWA (Safe Drinking Water Act) "No Lead restrictions of ANSI NSF 61 Sec. 9.
2. P-traps.
 - a. P-traps shall be PVC with cleanout, PVC adjustable wall bend, PVC slip nuts and no reducing washers.
 - b. Traps shall have shallow flange and minimum of 2" water seal, 1 1/2" size.
 - c. For accessible fixtures, utilize typical offset configured drain if fixture does not meet ADA requirements.
 - d. Trap shall be certified by a recognized testing authority and stamped with such insignia, and marked with the manufacturer's name clearly legible for inspection. Acceptable manufacturers are Brasscraft, Keeney, McGuire, and Zurn, all commercial grades.
 3. Provide a thermostatic hot water safety mixing valve in heavy-duty bronze, capable of accurate control of mixed water in plus or minus 3°F up to 120°F at each accessible and common area lavatory. Set to a maximum temperature of 110°F.
 4. Provide grid drains for with 1 1/4" or 1 1/2" chrome-plated cast brass strainer, open grid style with brass lock nut. Drain tailpiece shall be 17-gauge seamless brass or PVC tube and minimum of 6" long. Grid drain shall be certified by a recognized testing authority and marked with the manufacturer's name. Acceptable manufacturers are Dearborn, McGuire, Keeney, and Zurn.
 5. All exposed water supply and drain pipes under accessible lavatories shall be protected with an anti-microbial white vinyl insulating outer shell. Material shall be flame retardant and fungal and bacterial resistant. Insulating kits shall include covers for drain tailpiece, all p-trap components, and all hot and cold water supplies including mixing valve. Acceptable manufacturers are McGuire, Truebro, or Plumberex.

2.04 SINKS

A. Manufacturers:

1. American Standard, Inc: www.americanstandard-us.com.
2. Elkay Manufacturing Company: www.elkayusa.com
3. Kohler Company: www.kohler.com.
4. Zurn Industries, Inc[<>]: www.zurn.com.
5. Substitutions: See Section 01 60 00 - Product Requirements.

B. **Double Compartment Bowl: (KS-1A)**

1. Sink: ASME A122.19.3; 33 inch by 22 inch outside (each bowl 14 inch by 15-3/4 inch by 6-3/8 inch inside depth) self-rimming with sound-deadening material
 - a. 22 gauge, Type 300 series stainless steel
 - b. 1-1/2" faucet holes on 4-inch centers. Contractor to coordinate number of faucet holes with faucet.
 - c. ICC **ANSI** A117.1 Compliant
 - d. Basis of Design: Elkay Manufacturing: Model: Dayton 23322: www.elkayusa.com
2. Faucet: Solid brass fabricated body, 8-11/16 inch long spout with 180° swing, single lever handle, chrome sprayhead with antisiphon device.

- a. Side-spray with separate escutcheon
 - b. 1.5 gpm maximum flow at 60 psi
 - c. ICC **ANSI** A117.1 Compliant
 - d. Basis of Design: Wolverine Brass : Model 85061
- C. Accessories:
1. Supply Kits.
 - a. Shutoff valves.
 - 1) Use 1/4-turn ball valves as shutoff valves, gate valves are not acceptable.
 - 2) All stops shall be commercial-grade chrome plated brass stops with brass stems and handles. No plastic stems or handles.
 - 3) Risers shall be chrome-plated copper.
 - 4) All stops shall utilize threaded or sweat connections on supply-side (inlet to stop). No compression fittings are allowed on the inlet side of the stop.
 - 5) Loose key stops required for all exposed areas. Handle stops are acceptable under sinks and/or lavatories located in cabinetry.
 - 6) Acceptable manufacturers are Brasscraft, Keeney, McGuire, Watts, and Zurn, all commercial grades.
 - b. Inlet and outlet sizes for all supplies shall be 3/8" or 1/2" as needed.
 - c. Stainless steel flexible supplies as manufactured by Watts or Brasscraft are allowed.
 - d. Supply kit shall be certified by a recognized testing authority, marked with the manufacturer's name and shall comply with the SDWA (Safe Drinking Water Act) "No Lead restrictions of ANSI NSF 61 Sec. 9.
 2. P-traps.
 - a. P-traps shall be PVC with cleanout, PVC adjustable wall bend, PVC slip nuts and no reducing washers.
 - b. P-traps shall be chrome-plated cast brass with cleanout, 17-gauge seamless brass adjustable wall bend, cast brass slip nuts and no reducing washers.
 - c. Traps shall have shallow flange and minimum of 2" water seal, 1 1/2" size.
 - d. For accessible fixtures, utilize typical offset configured drain if fixture does not meet ADA requirements.
 - e. Trap shall be certified by a recognized testing authority and stamped with such insignia, and marked with the manufacturer's name clearly legible for inspection. Acceptable manufacturers are Brasscraft, Keeney, McGuire, and Zurn, all commercial grades.
 3. Provide a thermostatic hot water safety mixing valve meeting ASSE 1070 in heavy-duty bronze, capable of accurate control of mixed water in plus or minus 3°F up to 120°F at each accessible and common area sink. Set to a maximum temperature of 110°F.
 4. All exposed water supply and drain pipes under accessible sinks shall be protected with an anti-microbial white vinyl insulating outer shell. Material shall be flame retardant and fungal and bacterial resistant. Insulating kits shall include covers for drain tailpiece, all p-trap components, and all hot and cold water supplies including mixing valve. Acceptable manufacturers are McGuire, Truebro, or Plumberex.

2.05 ELECTRIC WATER COOLERS

- A. Electric Water Cooler Manufacturers:
1. Elkay Manufacturing Company: www.elkay.com.
 2. Haws Corporation: www.hawsco.com.

3. Halsey Taylor: www.halseytaylor.com.
4. Oasis International: www.oasiscoolers.com.
5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Wall-Mounted Bi-Level Water Cooler with bottle filler: (EWC-1A)

1. Electric, mechanically refrigerated; non-filtered; surface handicapped mounted; stainless steel top, vinyl on steel body, elevated anti-squirt bubbler with stream guard, automatic stream regulator, push-button, mounting bracket; integral air-cooled condenser.
2. Capacity: 8 gallons per hour of 50 degrees F water with inlet at 80 degrees F and room temperature of 90 degrees F, when tested in accordance with ASHRAE Std 18.
3. Electrical: 115 V, 60 Hertz compressor, 6 foot cord and plug for connection to electric wiring system including grounding connector.
4. ICC **ANSI** A117.1 Compliant
5. Cane apron installed to provide mandatory 27" floor to underside requirement when mounted for compliance with ADA
6. Basis of Design: Elkay Model EZSTL8WSLK

2.06 Laundry Tub (LT-1)

A. Service Sink Manufacturers:

1. E.I. Mustee & Sons, Inc: www.mustee.com.
2. Florestone Corporation: www.florestone.com
3. Just Manufacturing Company: www.justmfg.com.
4. Swan Corporation; www.swanstone.com
5. Zurn Industries, Inc: www.zurn.com.
6. Substitutions: See Section 01 60 00 - Product Requirements.

B. Bowl: 20 by 24 by 34-7/8 inch high, white, set of legs with built-in levelers, and stopper.

C. Laundry Tub Faucet: Chrome-plated cast brass laundry tub faucet with two 1" holes on 4" centers with 6 inch long swivel spout with an integral 3/8 inch hose threaded outlet.

1. Basis of Design: Wolverine Brass model EBS1340

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.
- B. Verify cabinet and rough-in sizes prior to purchase of fixtures.

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 fixtures per manufacturers instructions.
- B. Install each fixture with trap, easily removable for servicing and cleaning.
- C. Install components level and plumb.
- D. Install and secure fixtures in place with wall supports and bolts.
- E. Install Water Closets with Trip lever positioned on approach side.

3.04 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 05 00 - COMMON WORK RESULTS FOR HVAC

PART 1 GENERAL

1.01 SCOPE OF WORK FOR HVAC

- A. Contractor shall provide all labor, materials, equipment, permits, inspection fees, utility company charges, supervision and other items noted in contract General Conditions necessary to yield completely operable and tested systems as indicated on the Plans and specified herein. The Work includes, but is not limited to, the following areas:
 - 1. Building HVAC systems:
 - a. Demolition of existing systems as indicated.
 - b. Air handling equipment.
 - 1) Ductwork
 - 2) Exhaust Wall Caps
 - 3) Any related accessories.
 - 2. Mechanical insulation for ductwork as specified.
- B. Maintain records of changes to the drawings as they occur in the field, and submit same to the Owner and/or Architect/Engineer as requested within 90 days after the date of system acceptance as required by the code listed below, and the General Conditions of this specification for additional information.
 - 1. International Energy Conservation Code (ASHRAE 90.1-2013, Section 6.7.2.1)
- C. Cleanup associated with work of respective trades.
- D. No asbestos or mercury containing materials, materials capable of discharging lead into potable water or air systems, or materials capable of releasing other hazardous substances to the facility air environment, drainage systems, or water systems shall be used.
- E. Equipment schedules are provided as a convenience to the Contractor, but do not relieve him of his responsibility to furnish all items shown on the plans and indicated in the specifications.
- F. All equipment furnished and installed shall comply with the relevant agency listing, testing, and labeling requirements of the following codes.
 - 1. 2017 Ohio Mechanical Code
 - 2. 2017 Ohio Plumbing Code
 - 3. 2015 International Fuel Gas Code
 - 4. 2017 Ohio Energy Code
- G. Coordination with other trades. Contractor shall assist in the field layout and coordination of equipment, ductwork, and piping installation and their relation with other trades at no additional cost to the owner.
- H. Touch-up painting of damaged materials furnished by this contractor and damaged by this contractor. Each mechanical contractor shall be responsible for replacement/patching of all finish materials which have been disrupted and/or damaged as a result of their construction procedures. All materials shall match original and all work shall be done by experienced field tradesmen
- I. Minimum one year labor and equipment guarantee on completed installation. See equipment specifications if longer equipment guarantee is required.
- J. Cost of Mechanical Permits.
- K. Job Site safety is the responsibility of the contractor. The architect/engineer bears no responsibility for job-site safety.
- L. Owner training in operation and maintenance of installed equipment and systems. Using the Operating and Maintenance manuals, balancing report data, and construction plans and

specifications, contractor shall instruct owner's representatives in the proper operation of the equipment and systems installed to their mutual satisfaction. This activity shall take place near the point of substantial completion and will be considered one of the final punch list issues.

Training shall consist of a period of "classroom" instruction providing a general overview of the facility equipment and systems plus a tour of the facility and its equipment pointing out specific maintenance issues for each area and item of equipment. When the training is complete owner shall be provided with a training certificate by the contractor by which the owner will acknowledge that such training has taken place.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 23 07 13 - DUCT INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Duct insulation.
- B. Insulation jackets.

1.02 REFERENCE STANDARDS

- A. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- B. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.
- C. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.
- D. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014 (Reapproved 2019).
- E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
- F. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all products in one submittal for review. Do not include products described in other specification sections.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

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, RIGID

- A. Manufacturer:
 - 1. Johns Manville: www.jm.com.
 - 2. Knauf Insulation: www.knaufinsulation.com.
 - 3. Owens Corning Corporation: www.ocbuildingspec.com.
 - 4. CertainTeed Corporation: www.certainteed.com.
 - 5. Substitutions: See Section 01 60 00 - 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 lb/cu ft.
- 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.

2.03 JACKETS

- A. Canvas Jacket: UL listed 6 oz/sq yd plain weave cotton fabric treated with dilute fire retardant lagging adhesive.
- B. Aluminum Jacket: ASTM B209 (ASTM B209M).
 - 1. Thickness: 0.016 inch sheet.
 - 2. Finish: Smooth.
 - 3. Joining: Longitudinal slip joints and 2 inch laps.
 - 4. Fittings: 0.016 inch thick die shaped fitting covers with factory attached protective liner.
 - 5. Metal Jacket Bands: 3/8 inch wide; 0.015 inch thick aluminum.
 - 6. Metal Jacket Bands: 3/8 inch wide; 0.010 inch thick stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that ducts have been tested before applying insulation materials.
- B. Verify that surfaces are clean, foreign material removed, and dry.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NAIMA National Insulation Standards.
- C. Ducts Exposed in Mechanical Equipment Rooms or Finished Spaces (below 10 feet above finished floor): Finish with canvas jacket sized for finish painting.
- D. External Duct Insulation Application:
 - 1. Secure insulation with vapor barrier with wires and seal jacket joints with vapor barrier adhesive or tape to match jacket.
 - 2. Secure insulation without vapor barrier with staples, tape, or wires.
 - 3. Install without sag on underside of duct. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift duct off trapeze hangers and insert spacers.
 - 4. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive.
 - 5. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.

3.03 SCHEDULES

- A. All insulation thermal resistance values shall comply with ASHRAE 90.1 per section 23 05 00.
- B. All insulation thicknesses shall comply with Mechanical Code per section 23 05 00.
- C. Exhaust Ducts
 - 1. Exhaust Ducts within conditioned space:
 - a. No Insulation.
 - 2. Exhaust Ducts Within 10 ft of Exterior Openings:
 - a. R-6 minimum
 - b. Glass Fiber, Rigid

END OF SECTION

SECTION 23 31 00 - HVAC DUCTS AND CASINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal ductwork.
- B. Duct cleaning.

1.02 RELATED REQUIREMENTS

- A. Section 09 91 23 - Interior Painting: Weld priming, paint or coating.
- B. Section 23 07 13 - Duct Insulation: External insulation and duct liner.
- C. Section 23 33 00 - Air Duct Accessories.
- D. Section 23 37 00 - Air Outlets and Inlets.

1.03 REFERENCE STANDARDS

- A. ASHRAE (FUND) - ASHRAE Handbook - Fundamentals; Most Recent Edition Cited by Referring Code or Reference Standard.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
- E. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.
- F. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations; 2024.
- G. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.
- H. SMACNA (KVS) - Kitchen Ventilation Systems and Food Service Equipment Fabrication and Installation Guidelines; 2001.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all items listed below in one submittal for review. Do not include products described in other specification sections.
- B. Product Data: Provide data for duct materials, assembly, and factory insulation.

1.05 FIELD CONDITIONS

- A. Maintain temperatures within acceptable range during and after installation of duct sealants.
- B. Seal and cover duct openings until time of completion. Duct cleaning shall be performed at end of project if ducts are not sealed during construction.

PART 2 PRODUCTS

2.01 DUCT ASSEMBLIES

- A. Regulatory Requirements: Construct ductwork to comply with NFPA 90A standards.
- B. Ducts: Galvanized steel, unless otherwise indicated.
- C. Low Pressure Supply, Return, Transfer, Intake, and General Exhaust: 1/2 inch w.g. pressure class, galvanized steel.

2.02 MATERIALS

- A. Galvanized Steel for Ducts: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating.
- B. Joint Sealers and Sealants: Non-hardening, water resistant, mildew and mold resistant.
 - 1. Type: Heavy mastic or liquid used alone or with tape, suitable for joint configuration and compatible with substrates, and recommended by manufacturer for pressure class of

ducts.

2. VOC Content: Not more than 250 g/L, excluding water.
 3. Surface Burning Characteristics: Flame spread index of zero and smoke developed index of zero, when tested in accordance with ASTM E84.
 4. For Use With Flexible Ducts: UL labeled.
- C. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

2.03 DUCTWORK FABRICATION

- A. Fabricate and support in accordance with SMACNA (DCS) and as indicated.
- B. No variation of duct configuration or size permitted except by written permission. Size round duct installed in place of rectangular ducts in accordance with ASHRAE (FUND) Handbook - Fundamentals.
- C. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
- D. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows must be used, provide air foil turning vanes of perforated metal with glass fiber insulation.
- E. Fabricate continuously welded round and oval duct fittings in accordance with SMACNA (DCS).
- F. Where ducts are connected to exterior wall louvers and duct outlet is smaller than louver frame, provide blank-out panels sealing louver area around duct. Use same material as duct, painted black on exterior side; seal to louver frame and duct.

2.04 MANUFACTURED DUCTWORK AND FITTINGS

- A. Manufacturers:
 1. CaptiveAire; www.captiveaire.com.
 2. McGill Airflow LLC; www.mcgillairflow.com.
 3. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Spiral Ducts: Round spiral lockseam duct with galvanized steel outer wall.
 1. Manufacture in accordance with SMACNA (DCS).
- C. Round Ducts: Round lockseam duct with galvanized steel outer wall.
 1. Manufacture in accordance with SMACNA (DCS).

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install, support, and seal ducts in accordance with SMACNA (DCS).
- B. Install in accordance with manufacturer's instructions.
- C. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- D. Duct sizes indicated are inside clear dimensions. For lined ducts, maintain sizes inside lining.
- E. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
- F. Duct Leakage in residential duct systems:
 1. Rough-in test: The total duct leakage shall be less than or equal to 4 CFM per 100 square feet of conditioned floor area where the air handler is installed at time of test. Where the air handler is not installed at the time of the test, the total leakage shall be less than or equal to 3 CFM per 100 square feet of conditioned floor area.
 2. Postconstruction test: Total leakage shall be less than or equal to 4 CFM per 100 square feet of conditioned floor area.
 3. A duct air leakage test is not required where the ducts and air handlers are located entirely within the building thermal envelope

3.02 CLEANING

- A. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.
- B. Clean duct systems with high power vacuum machines. Protect equipment that could be harmed by excessive dirt with filters, or bypass during cleaning. Provide adequate access into ductwork for cleaning purposes.

END OF SECTION

SECTION 23 33 00 - AIR DUCT ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Backdraft dampers.

1.02 RELATED REQUIREMENTS

- A. Section 23 31 00 - HVAC Ducts and Casings.

1.03 REFERENCE STANDARDS

- A. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Furnish all products in one submittal for review. Do not include products described in other specification sections.
- B. Product Data: Provide manufacturer catalog data for all products.

PART 2 PRODUCTS

2.01 BACKDRAFT DAMPERS

- A. Manufacturers:
 - 1. Louvers & Dampers, Inc, a brand of Mestek, Inc: www.louvers-dampers.com.
 - 2. Nailor Industries, Inc: www.nailor.com.
 - 3. Ruskin Company: www.ruskin.com.
 - 4. Substitutions: See Section 01 60 00 - 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. Multi-Blade, Parallel Action Gravity Balanced Backdraft Dampers: Galvanized steel, with center pivoted blades of maximum 6 inch width, with felt or flexible vinyl sealed edges, linked together in rattle-free manner with 90 degree stop, steel ball bearings, and plated steel pivot pin; adjustment device to permit setting for varying differential static pressure.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA (DCS). Refer to Section 23 31 00 for duct construction and pressure class.
- B. Provide backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.

END OF SECTION

SECTION 23 37 00 - AIR OUTLETS AND INLETS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wall caps

1.02 RELATED REQUIREMENTS

- A. Section 09 91 23 - Interior Painting: Painting of ducts visible behind outlets and inlets.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures. Furnish all products in one submittal for review. Do not include products described in other specification sections.
- B. Color Selections: Color samples shall be submitted as a hard copy to the Architect. Electronic copies are not permitted.

1.05 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 Wall Caps

A. Manufacturers:

1. Broan-NuTone, LLC: www.broan-nutone.com
2. Primex: www.primexvents.com
3. Seiho International, Inc: www.seiho.com
4. XVentBox: www.xventbox.com
5. Substitutions: See Section 01 60 00 - Product Requirements

B. Wall Caps:

1. Type: Low-profile hooded design with backdraft damper and mesh screen
2. Construction: Polymer resin; with UV protection and impact resistance
3. Construction: Galvanized steel, minimum 16 gage, or aluminum, minimum 16 gage; with factory-baked enamel finish.
4. Application:
 - a. Dryer Exhaust: Dryer rated with backdraft damper, less bird screen.
 - b. Bath and Kitchen Exhaust: Provide with backdraft damper and bird screen.
5. Color: As selected by Architect from manufacturer's standard range.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Check location of outlets and make necessary adjustments in position to comply with architectural features, symmetry, and lighting arrangement.

END OF SECTION

SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Scope of work related to the building lighting and power systems..

1.02 SCOPE OF WORK FOR ELECTRICAL

- A. Contractor shall provide all labor, materials, equipment, permits, inspection fees, utility company charges, supervision and other items noted in contract General Conditions necessary to yield completely operable and tested systems as indicated on the Plans and specified herein. The Work includes, but is not limited to, the following areas:
 - 1. Building lighting and power distribution systems :
 - a. Provide an underground electrical service to the facility.
 - b. Provide an electrical distribution system for power and lighting.
 - c. Provide interior and exterior power distribution systems for receptacles, building equipment, mechanical and plumbing equipment.
 - d. Provide a building lightning protection system for the building structure and rooftop mounted equipment.
 - e. Provide GFCI protection per NEC 210.8 Ground-Fault Circuit-Interrupter Protection for Personnel
 - f. For dwelling units provide AFCI protection per NEC 210.12 Arc-Fault Circuit-Interrupter Protection
 - g. Provide rated or non-rated access panels for any junction box or electrical equipment that is concealed and needs to be maintained or accessed. Coordinate rating with wall or ceiling type.
 - B. Maintain records of changes to the drawings as they occur in the field, and submit same to the Owner and/or Architect/Engineer as requested within 90 days after the date of system acceptance as required the General Conditions of this specification for additional information.
 - C. Exterior aboveground not otherwise covered shall be primed/painted per spec section 09 90 00.
 - D. Equipment schedules are provided as a convenience to the Contractor, but do not relieve him of his responsibility to furnish all items shown on the plans and indicated in the specifications.
 - E. All equipment furnished and installed shall comply with the relevant agency listing, testing, and labeling requirements of the National Electric Code.
 - F. Coordination with other trades. Contractor shall assist in the field layout and coordination of equipment, power and lighting and their relation with other trades at no additional cost to the owner.
 - G. Touch-up painting of damaged materials furnished by this contractor and damaged by this contractor. Each electrical contractor shall be responsible for replacement/patching of all finish materials which have been disrupted and/or damaged as a result of their construction procedures. All materials shall match original and all work shall be done by experienced field tradesmen
 - H. One year labor and equipment guarantee on completed installation.
 - I. Job Site safety is the responsibility of the contractor. The architect/engineer bears no responsibility for job-site safety.

END OF SECTION

SECTION 26 05 05 - SELECTIVE DEMOLITION FOR ELECTRICAL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Electrical demolition.

1.02 RELATED REQUIREMENTS

- A. Section 01 70 00 - Execution and Closeout Requirements: Additional requirements for alterations work.
- B. Section 02 84 00 - Polychlorinate Biphenyl (PCB) Remediation: Removal of equipment and materials containing substances regulated under the Federal Toxic Substances Control Act (TSCA), including but not limited to those containing PCBs and mercury.

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 that abandoned wiring and equipment serve only abandoned facilities.
- B. Demolition drawings are based on casual field observation and existing record documents.
- C. Report discrepancies to Architect before disturbing existing installation.
- D. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION

- A. Disconnect electrical systems in walls, floors, and ceilings to be removed.
- B. Coordinate utility service outages with utility company.
- C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
- D. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.
 - 1. Obtain permission from Owner at least 24 hours before partially or completely disabling system.
 - 2. Make temporary connections to maintain service in areas adjacent to work area.
- E. Existing Fire Alarm System: Maintain existing system in service until new system is accepted. Disable system only to make switchovers and connections. Minimize outage duration.
 - 1. Notify Owner before partially or completely disabling system.
 - 2. Notify local fire service.
 - 3. Make notifications at least 24 hours in advance.
 - 4. Make temporary connections to maintain service in areas adjacent to work area.

3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Perform work for removal and disposal of equipment and materials containing toxic substances regulated under the Federal Toxic Substances Control Act (TSCA) in accordance with applicable federal, state, and local regulations. Applicable equipment and materials include, but are not limited to:
 - 1. PCB-containing electrical equipment, including transformers, capacitors, and switches.
 - 2. PCB- and DEHP-containing lighting ballasts.

3. Mercury-containing lamps and tubes, including fluorescent lamps, high intensity discharge (HID), arc lamps, ultra-violet, high pressure sodium, mercury vapor, ignitron tubes, neon, and incandescent.
 - B. Remove, relocate, and extend existing installations to accommodate new construction.
 - C. Remove abandoned wiring to source of supply.
 - D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
 - E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.
 - F. Disconnect and remove abandoned panelboards and distribution equipment.
 - G. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
 - H. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.
 - I. Repair adjacent construction and finishes damaged during demolition and extension work.
 - J. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.
 - K. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

3.04 CLEANING AND REPAIR

- A. See Section 01 74 19 - Construction Waste Management and Disposal for additional requirements.
- B. Clean and repair existing materials and equipment that remain or that are to be reused.
- C. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.
- D. Luminaires: Remove existing luminaires for cleaning. Use mild detergent to clean all exterior and interior surfaces; rinse with clean water and wipe dry. Replace lamps, ballasts and broken electrical parts.

END OF SECTION

SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Single conductor building wire.
- B. Nonmetallic-sheathed cable.
- C. Underground feeder and branch-circuit cable.
- D. Service entrance cable.
- E. Metal-clad cable.
- F. Wiring connectors.
- G. Electrical tape.
- H. Heat shrink tubing.
- I. Oxide inhibiting compound.
- J. Wire pulling lubricant.
- K. Cable ties.
- L. Firestop sleeves.

1.02 RELATED REQUIREMENTS

- A. Section 07 84 00 - Firestopping.
- B. Section 26 05 26 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.
- C. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
- D. Section 28 46 00 - Fire Detection and Alarm: Fire alarm system conductors and cables.

1.03 REFERENCE STANDARDS

- A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013 (Reapproved 2018).
- B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2023.
- C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010, with Editorial Revision (2020).
- D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2020).
- E. ASTM B800 - Standard Specification for 8000 Series Aluminum Alloy Wire for Electrical Purposes - Annealed and Intermediate Tempers; 2005 (Reapproved 2021).
- F. ASTM B801 - Standard Specification for Concentric-Lay-Stranded Conductors of 8000 Series Aluminum Alloy for Subsequent Covering or Insulation; 2018 (Reapproved 2023).
- G. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2017.
- H. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
- I. NECA 104 - Standard for Installing Aluminum Building Wire and Cable; 2012.
- J. NECA 120 - Standard for Installing Armored Cable (AC) and Type Metal-Clad (MC) Cable; 2018.
- K. NECA 121 - Standard for Installing Nonmetallic-Sheathed Cable (Type NM-B) and Underground Feeder and Branch-Circuit Cable (Type UF); 2007.
- L. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; 2021.

- M. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems; 2021.
- N. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- O. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.
- P. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.
- Q. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.
- R. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.
- S. UL 486D - Sealed Wire Connector Systems; Current Edition, Including All Revisions.
- T. UL 493 - Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables; Current Edition, Including All Revisions.
- U. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.
- V. UL 719 - Nonmetallic-Sheathed Cables; Current Edition, Including All Revisions.
- W. UL 854 - Service-Entrance Cables; Current Edition, Including All Revisions.
- X. UL 1569 - Metal-Clad Cables; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
 - 2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
 - 3. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

1.07 FIELD CONDITIONS

- A. Do not install or otherwise handle thermoplastic-insulated conductors at temperatures lower than 14 degrees F, unless otherwise permitted by manufacturer's instructions. When installation below this temperature is unavoidable, notify Architect and obtain direction before proceeding with work.

PART 2 PRODUCTS

2.01 CONDUCTOR AND CABLE APPLICATIONS

- A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
- B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.
- C. Nonmetallic-sheathed cable is permitted only as follows:
 - 1. Where not otherwise restricted, may be used:
 - a. For branch circuit wiring in dry locations within multifamily dwellings permitted to be of Types III, IV, and V construction.

2. In addition to other applicable restrictions, may not be used:
 - a. Where exposed to view.
 - b. Where exposed to damage.
 - c. For damp, wet, or corrosive locations.
- D. Underground feeder and branch-circuit cable is permitted only as follows:
 1. Where not otherwise restricted, may be used:
 - a. For damp, wet, or corrosive locations as a substitute for NFPA 70, Type NMC nonmetallic-sheathed cable, when nonmetallic-sheathed cable is permitted.
- E. Service entrance cable is permitted only as follows:
 1. Where not otherwise restricted, may be used:
 - a. For underground service entrance, installed in raceway.
 2. In addition to other applicable restrictions, may not be used:
 - a. Where exposed to damage.
- F. Armored cable is not permitted.
- G. Metal-clad cable is permitted only as follows:
 1. Where not otherwise restricted, may be used:
 - a. Where concealed above accessible ceilings for final connections from junction boxes to luminaires.
 - 1) Maximum Length: 6 feet.
 - b. Where concealed in hollow stud walls, above accessible ceilings, and under raised floors for branch circuits up to 20 A.
 - 1) Exception: Provide single conductor building wire in raceway for circuit homerun from first outlet to panelboard.

2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
- D. Comply with NEMA WC 70.
- E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
- F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
- G. Conductors for Grounding and Bonding: Also comply with Section 26 05 26.
- H. Conductor Material:
 1. Provide copper conductors except where aluminum conductors are specifically indicated. Substitution of aluminum conductors for copper is not permitted. Conductor sizes indicated are based on copper unless specifically indicated as aluminum.
 2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
 3. Tinned Copper Conductors: Comply with ASTM B33.
 4. Aluminum Conductors (only where specifically indicated or permitted for substitution): AA-8000 series aluminum alloy conductors recognized by ASTM B800 and compact stranded in accordance with ASTM B801 unless otherwise indicated.
- I. Minimum Conductor Size:
 1. Branch Circuits: 12 AWG.
 - a. Exceptions:

- 1) 20 A, 120 V circuits longer than 75 feet: 10 AWG, for voltage drop.
- 2) 20 A, 120 V circuits longer than 150 feet: 8 AWG, for voltage drop.
2. Control Circuits: 14 AWG.
- J. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
- K. Conductor Color Coding:
 1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
 2. Color Coding Method: Integrally colored insulation.
 - a. Conductors size 4 AWG and larger may have black insulation color coded using vinyl color coding electrical tape.
 3. Color Code:
 - a. 208Y/120 V, 3 Phase, 4 Wire System:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - 4) Neutral/Grounded: White.
 - b. Equipment Ground, All Systems: Green.
 - c. Travelers for 3-Way and 4-Way Switching: Pink.

2.03 SINGLE CONDUCTOR BUILDING WIRE

- A. Manufacturers:
 1. Copper Building Wire:
 - a. Cerro Wire LLC: www.cerrowire.com.
 - b. Encore Wire Corporation: www.encorewire.com.
 - c. General Cable Technologies Corporation: www.generalcable.com.
 - d. Southwire Company: www.southwire.com.
 2. Aluminum Building Wire (only where specifically indicated or permitted for substitution):
 - a. Encore Wire Corporation: www.encorewire.com.
 - b. Prysmian Power Cables and Systems: www.us.prysmian.com.
 - c. Southwire Company: www.southwire.com.
 - d. Stabiloy, a brand of General Cable Technologies Corporation: www.stabiloy.com.
- B. Description: Single conductor insulated wire.
- C. Conductor Stranding:
 1. Feeders and Branch Circuits:
 - a. Size 10 AWG and Smaller: Solid.
 - b. Size 8 AWG and Larger: Stranded.
 2. Control Circuits: Stranded.
- D. Insulation Voltage Rating: 600 V.
- E. Insulation:
 1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.

2.04 NONMETALLIC-SHEATHED CABLE

- A. Manufacturers:
 1. Cerro Wire LLC: www.cerrowire.com.
 2. Encore Wire Corporation: www.encorewire.com.
 3. Southwire Company: www.southwire.com.

- B. Description: NFPA 70, Type NM multiple-conductor cable listed and labeled as complying with UL 719, Type NM-B.
 - C. Conductor Stranding:
 - 1. Size 10 AWG and Smaller: Solid.
 - 2. Size 8 AWG and Larger: Stranded.
 - D. Insulation Voltage Rating: 600 V.
- 2.05 UNDERGROUND FEEDER AND BRANCH-CIRCUIT CABLE
- A. Manufacturers:
 - 1. Cerro Wire LLC: www.cerrowire.com.
 - 2. Encore Wire Corporation: www.encorewire.com.
 - 3. Southwire Company: www.southwire.com.
 - B. Description: NFPA 70, Type UF multiple-conductor cable listed and labeled as complying with UL 493, Type UF-B.
 - C. Provide equipment grounding conductor unless otherwise indicated.
 - D. Conductor Stranding:
 - 1. Size 10 AWG and Smaller: Solid.
 - 2. Size 8 AWG and Larger: Stranded.
 - E. Insulation Voltage Rating: 600 V.
- 2.06 SERVICE ENTRANCE CABLE
- A. Manufacturers:
 - 1. Copper Service Entrance Cable:
 - a. Cerro Wire LLC: www.cerrowire.com.
 - b. Encore Wire Corporation: www.encorewire.com.
 - c. Southwire Company: www.southwire.com.
 - B. Service Entrance Cable for Underground Use: NFPA 70, Type USE single-conductor cable listed and labeled as complying with UL 854, Type USE-2 and with UL 44 Type RHH/RHW-2.
 - C. Conductor Stranding: Stranded.
 - D. Insulation Voltage Rating: 600 V.
- 2.07 METAL-CLAD CABLE
- A. Manufacturers:
 - 1. AFC Cable Systems Inc: www.afcweb.com.
 - 2. Encore Wire Corporation: www.encorewire.com.
 - 3. Southwire Company: www.southwire.com
 - B. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569, and listed for use in classified firestop systems to be used.
 - C. Conductor Stranding:
 - 1. Size 10 AWG and Smaller: Solid.
 - 2. Size 8 AWG and Larger: Stranded.
 - D. Insulation Voltage Rating: 600 V.
 - E. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.
 - F. Grounding: Full-size integral equipment grounding conductor.
 - G. Armor: Steel, interlocked tape.
- 2.08 WIRING CONNECTORS
- A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as

applicable.

- B. Connectors for Grounding and Bonding: Comply with Section 26 05 26.
- C. Wiring Connectors for Splices and Taps:
 - 1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
 - 2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.
- D. Wiring Connectors for Terminations:
 - 1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.
 - 2. Provide compression adapters for connecting conductors to equipment furnished with mechanical lugs when only compression connectors are specified.
 - 3. Provide motor pigtail connectors for connecting motor leads in order to facilitate disconnection.
 - 4. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.
 - 5. Stranded Conductors Size 10 AWG and Smaller: Use crimped terminals for connections to terminal screws.
 - 6. Conductors for Control Circuits: Use crimped terminals for all connections.
- E. Do not use insulation-piercing or insulation-displacement connectors designed for use with conductors without stripping insulation.
- F. Do not use push-in wire connectors as a substitute for twist-on insulated spring connectors.
- G. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F for standard applications and 302 degrees F for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.
 - 1. Manufacturers:
 - a. 3M: www.3m.com.
 - b. Ideal Industries, Inc: www.idealindustries.com.
 - c. NSI Industries LLC: www.nsiindustries.com.
- H. Mechanical Connectors: Provide bolted type or set-screw type.
 - 1. Manufacturers:
 - a. Burndy: www.burndy.com.
 - b. IlSCO: www.ilSCO.com.
 - c. Thomas & Betts Corporation: www.tnb.com.
- I. Compression Connectors: Provide circumferential type or hex type crimp configuration.
 - 1. Manufacturers:
 - a. Burndy: www.burndy.com.
 - b. IlSCO: www.ilSCO.com.
 - c. Thomas & Betts Corporation: www.tnb.com.
- J. Crimped Terminals: Nylon-insulated, with insulation grip and terminal configuration suitable for connection to be made.
 - 1. Manufacturers:
 - a. Burndy: www.burndy.com.
 - b. IlSCO: www.ilSCO.com.
 - c. Thomas & Betts Corporation: www.tnb.com.

2.09 ACCESSORIES

- A. Electrical Tape:

1. Manufacturers:
 - a. 3M: www.3m.com.
 - b. Plymouth Rubber Europa: www.plymouthrubber.com.
2. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F.
3. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.
4. Moisture Sealing Electrical Tape: Insulating mastic compound laminated to flexible, all-weather vinyl backing; minimum thickness of 90 mil.
- B. Heat Shrink Tubing: Heavy-wall, split-resistant, with factory-applied adhesive; rated 600 V; suitable for direct burial applications; listed as complying with UL 486D.
- C. Oxide Inhibiting Compound: Listed; suitable for use with the conductors or cables to be installed.
- D. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.
- E. Cable Ties: Material and tensile strength rating suitable for application.
- F. Firestop Sleeves: Listed; provide as required to preserve fire resistance rating of building elements.
 1. Products:
 - a. Hilti CFS 653 Speed Sleeve: www.hilti.com.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that work likely to damage wire and cable has been completed.
- C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
- D. Verify that field measurements are as indicated on the drawings.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.03 INSTALLATION

- A. Circuiting Requirements:
 1. Unless dimensioned, circuit routing indicated is diagrammatic.
 2. When circuit destination is indicated and routing is not indicated, determine exact routing required.
 3. Arrange circuiting to minimize splices.
 4. Include circuit lengths required to install connected devices within 10 ft of location indicated.
 5. Maintain separation of Class 1, Class 2, and Class 3 remote-control, signaling, and power-limited circuits in accordance with NFPA 70.
- B. Install products in accordance with manufacturer's instructions.
- C. Perform work in accordance with NECA 1 (general workmanship).
- D. Install aluminum conductors in accordance with NECA 104.

- E. Install underground feeder and branch-circuit cable (Type UF-B) in accordance with NECA 121.
- F. Install metal-clad cable (Type MC) in accordance with NECA 120.
- G. Installation in Raceway:
 - 1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
 - 2. Pull all conductors and cables together into raceway at same time.
 - 3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
 - 4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.
- H. Exposed Cable Installation (only where specifically permitted):
 - 1. Route cables parallel or perpendicular to building structural members and surfaces.
 - 2. Protect cables from physical damage.
- I. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.
- J. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
 - 1. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conductors and cables to lay on ceiling tiles.
 - 2. Installation in Vertical Raceways: Provide supports where vertical rise exceeds permissible limits.
- K. Terminate cables using suitable fittings.
 - 1. Metal-Clad Cable (Type MC):
 - a. Use listed fittings.
 - b. Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.
- L. Install conductors with a minimum of 12 inches of slack at each outlet.
- M. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.
- N. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.
- O. Make wiring connections using specified wiring connectors.
 - 1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
 - 2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
 - 3. Do not remove conductor strands to facilitate insertion into connector.
 - 4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
 - 5. Connections for Aluminum Conductors: Fill connectors with oxide inhibiting compound where not pre-filled by manufacturer.
 - 6. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.

- 7. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
- P. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
 - 1. Dry Locations: Use insulating covers specifically designed for the connectors.
 - 2. Damp Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.
 - a. For connections with insulating covers, apply outer covering of moisture sealing electrical tape.
 - b. For taped connections, follow same procedure as for dry locations but apply outer covering of moisture sealing electrical tape.
- Q. Insulate ends of spare conductors using vinyl insulating electrical tape.
- R. Field-Applied Color Coding: Where vinyl color coding electrical tape is used in lieu of integrally colored insulation as permitted in Part 2 under "Color Coding", apply half overlapping turns of tape at each termination and at each location conductors are accessible.
- S. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.
- T. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for additional requirements.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is required for all conductors. The resistance test for parallel conductors listed as optional is not required.
- D. Correct deficiencies and replace damaged or defective conductors and cables.

END OF SECTION

SECTION 26 05 33.13 - CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

- A. Section 07 84 00 - Firestopping.
- B. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
 - 1. Includes additional requirements for fittings for grounding and bonding.
- C. Section 26 05 29 - Hangers and Supports for Electrical Systems.
- D. Section 26 05 33.16 - Boxes for Electrical Systems.
- E. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
- F. Section 26 21 00 - Low-Voltage Electrical Service Entrance: Additional requirements for electrical service conduits.
- G. Section 26 2701 - Electrical Utility Service: Additional requirements for electrical service conduits.

1.02 REFERENCE STANDARDS

- A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2020.
- B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S); 2020.
- C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
- D. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); 2020.
- E. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); 2017.
- F. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.
- G. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; 2020.
- H. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; 2021.
- I. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- J. UL 1 - Flexible Metal Conduit; Current Edition, Including All Revisions.
- K. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.
- L. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.
- M. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.
- N. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate minimum sizes of conduits with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
 - 2. Coordinate the arrangement of conduits with structural members, ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
 - 3. Verify exact conduit termination locations required for boxes, enclosures, and equipment installed under other sections or by others.
 - 4. Coordinate the work with other trades to provide roof penetrations that preserve the integrity of the roofing system and do not void the roof warranty.
 - 5. Notify Architect and Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Sequencing:

1. Do not begin installation of conductors and cables until installation of conduit is complete between outlet, junction and splicing points.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittals procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.

1.05 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 CONDUIT APPLICATIONS

- A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.
- B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.
- C. Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit.
 1. Maximum Length: 6 feet.

2.02 CONDUIT REQUIREMENTS

- A. Existing Work: Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion, and integrity is verified by pulling a mandrel through them.
- B. Electrical Service Conduits: Also comply with Section 26 21 00.
- C. Communications Systems Conduits: Also comply with Section 27 10 00.
- D. Fittings for Grounding and Bonding: Also comply with Section 26 05 26.
- E. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.
- F. Provide products listed, classified, and labeled as suitable for the purpose intended.
- G. Minimum Conduit Size, Unless Otherwise Indicated:
 1. Branch Circuits: 1/2 inch (16 mm) trade size.
 2. Branch Circuit Homeruns: 3/4 inch (21 mm) trade size.
 3. Control Circuits: 1/2 inch (16 mm) trade size.
 4. Flexible Connections to Luminaires: 3/8 inch (12 mm) trade size.
 5. Underground, Interior: 3/4 inch (21 mm) trade size.
 6. Underground, Exterior: 1 inch (27 mm) trade size.
- H. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

- A. Manufacturers:
 1. Allied Tube & Conduit: www.alliedeg.com.
 2. Republic Conduit: www.republic-conduit.com.
 3. Wheatland Tube Company: www.wheatland.com.

- B. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.
- C. Fittings:
 - 1. Manufacturers:
 - a. Bridgeport Fittings Inc: www.bptfittings.com.
 - b. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com.
 - c. Thomas & Betts Corporation: www.tnb.com.
 - 2. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 - 3. Material: Use steel or malleable iron.
 - 4. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.04 FLEXIBLE METAL CONDUIT (FMC)

- A. Manufacturers:
 - 1. AFC Cable Systems, Inc: www.afcweb.com.
 - 2. Electri-Flex Company: www.electriflex.com.
 - 3. International Metal Hose: www.metalhose.com.
- B. Description: NFPA 70, Type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.
- C. Fittings:
 - 1. Manufacturers:
 - a. Bridgeport Fittings Inc: www.bptfittings.com.
 - b. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com.
 - c. Thomas & Betts Corporation: www.tnb.com.
 - 2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 - 3. Material: Use steel or malleable iron.

2.05 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

- A. Manufacturers:
 - 1. Cantex Inc: www.cantexinc.com.
 - 2. Carlon, a brand of Thomas & Betts Corporation: www.carlon.com.
 - 3. JM Eagle: www.jmeagle.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.
- C. Fittings:
 - 1. Manufacturer: Same as manufacturer of conduit to be connected.
 - 2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive conduits.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.
- D. Install rigid polyvinyl chloride (PVC) conduit in accordance with NECA 111.
- E. Conduit Routing:
 - 1. Unless dimensioned, conduit routing indicated is diagrammatic.
 - 2. When conduit destination is indicated without specific routing, determine exact routing required.
 - 3. Conceal all conduits unless specifically indicated to be exposed.
 - 4. Conduits in the following areas may be exposed, unless otherwise indicated:
 - a. Electrical rooms.
 - b. Mechanical equipment rooms.
 - c. Within joists in areas with no ceiling.
 - 5. Unless otherwise approved, do not route conduits exposed:
 - a. Across floors.
 - b. Across roofs.
 - c. Across top of parapet walls.
 - d. Across building exterior surfaces.
 - 6. Conduits installed underground or embedded in concrete may be routed in the shortest possible manner unless otherwise indicated. Route all other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.
 - 7. Arrange conduit to maintain adequate headroom, clearances, and access.
 - 8. Arrange conduit to provide no more than the equivalent of four 90 degree bends between pull points.
 - 9. Route conduits above water and drain piping where possible.
 - 10. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.
 - 11. Maintain minimum clearance of 6 inches between conduits and piping for other systems.
 - 12. Maintain minimum clearance of 12 inches between conduits and hot surfaces. This includes, but is not limited to:
 - a. Heaters.
 - b. Hot water piping.
 - c. Flues.
- F. Conduit Support:
 - 1. Secure and support conduits in accordance with NFPA 70 and Section 26 05 29 using suitable supports and methods approved by the authority having jurisdiction.
 - 2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
 - 3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
- G. Connections and Terminations:
 - 1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
 - 2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.

3. Use suitable adapters where required to transition from one type of conduit to another.
 4. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
 5. Where spare conduits stub up through concrete floors and are not terminated in a box or enclosure, provide threaded couplings equipped with threaded plugs set flush with finished floor.
 6. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
 7. Secure joints and connections to provide maximum mechanical strength and electrical continuity.
- H. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
 2. Make penetrations perpendicular to surfaces unless otherwise indicated.
 3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
 4. Conceal bends for conduit risers emerging above ground.
 5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
 6. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
 7. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty. Include proposed locations of penetrations and methods for sealing with submittals.
 8. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.
- I. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
 2. Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.
 3. Where conduits are subject to earth movement by settlement or frost.
- J. Condensation Prevention: Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:
1. Where conduits pass from outdoors into conditioned interior spaces.
 2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.
- K. Provide grounding and bonding in accordance with Section 26 05 26.
- L. Identify conduits in accordance with Section 26 05 53.
- 3.03 FIELD QUALITY CONTROL
- A. See Section 01 40 00 - Quality Requirements, for additional requirements.
 - B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

- C. Correct deficiencies and replace damaged or defective conduits.

3.04 CLEANING

- A. Clean interior of conduits to remove moisture and foreign matter.

3.05 PROTECTION

- A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION

SECTION 26 05 33.16 - BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Outlet and device boxes up to 100 cubic inches, including those used as junction and pull boxes.
- B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches.
- C. Underground boxes/enclosures.
- D. Wall and ceiling outlet boxes.
- E. Pull and junction boxes.

1.02 RELATED REQUIREMENTS

- A. Section 07 84 00 - Firestopping.
- B. Section 08 31 00 - Access Doors and Panels: Panels for maintaining access to concealed boxes.
- C. Section 26 05 29 - Hangers and Supports for Electrical Systems.
- D. Section 26 05 33.13 - Conduit for Electrical Systems:
 - 1. Conduit bodies and other fittings.
 - 2. Additional requirements for locating boxes to limit conduit length and/or number of bends between pulling points.
- E. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
- F. Section 26 27 26 - Wiring Devices:
 - 1. Wall plates.
 - 2. Additional requirements for locating boxes for wiring devices.
- G. Section 27 10 00 - Structured Cabling: Additional requirements for communications systems outlet boxes.
- H. Section 26 2726 - Wiring Devices: Wall plates in finished areas.

1.03 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
- B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.
- C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.
- D. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; 2013 (Reaffirmed 2020).
- E. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports; 2013 (Reaffirmed 2020).
- F. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.
- G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. SCTE 77 - Specifications for Underground Enclosure Integrity; 2023.
- I. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
- J. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.
- K. UL 508A - Industrial Control Panels; Current Edition, Including All Revisions.
- L. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.
4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
6. Coordinate the work with other trades to preserve insulation integrity.
7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
8. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Products: Provide products listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 BOXES

A. General Requirements:

1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
3. Provide products listed, classified, and labeled as suitable for the purpose intended.
4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
5. Provide grounding terminals within boxes where equipment grounding conductors terminate.

B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:

1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
3. Use suitable concrete type boxes where flush-mounted in concrete.
4. Use suitable masonry type boxes where flush-mounted in masonry walls.
5. Use raised covers suitable for the type of wall construction and device configuration where required.
6. Use shallow boxes where required by the type of wall construction.
7. Do not use "through-wall" boxes designed for access from both sides of wall.
8. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.

9. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
 10. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
 11. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.
 12. Wall Plates: Comply with Section 26 27 26.
- C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
 2. NEMA 250 Environment Type, Unless Otherwise Indicated:
 3. Junction and Pull Boxes Larger Than 100 cubic inches:
 - a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.
- D. Underground Boxes/Enclosures:
1. Description: In-ground, open bottom boxes furnished with flush, non-skid covers with legend indicating type of service and stainless steel tamper resistant cover bolts.
 2. Size: As indicated on drawings.
 3. Depth: As required to extend below frost line to prevent frost upheaval, but not less than 12 inches.
 4. Provide logo on cover to indicate type of service.
 5. Applications:
 - a. Do not use polymer concrete enclosures in areas subject to deliberate vehicular traffic.
 6. Polymer Concrete Underground Boxes/Enclosures: Comply with SCTE 77.
 - a. Manufacturers:
 - 1) Hubbell Incorporated; Quazite Products: www.hubbellpowersystems.com.
 - 2) MacLean Highline: www.macleanhigline.com.
 - 3) Oldcastle Precast, Inc: www.oldcastleprecast.com.
 - b. Combination fiberglass/polymer concrete boxes/enclosures are acceptable.

2.02 MANUFACTURERS

- A. Appleton Electric: www.appletonelec.com.
- B. Arc-Co./Division of Arcade Technology: www.arc-co.com.
- C. Unity Manufacturing: www.unitymfg.com.

2.03 OUTLET BOXES

- A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
 1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 1/2 inch male fixture studs where required.
- B. Nonmetallic Outlet Boxes: NEMA OS 2.
- C. Cast Boxes: NEMA FB 1, Type FD, aluminum. Provide gasketed cover by box manufacturer. Provide threaded hubs.
- D. Wall Plates for Finished Areas: As specified in Section 26 2726.

2.04 PULL AND JUNCTION BOXES

- A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.
- B. Hinged Enclosures: As specified in Section 26 2716.

- C. Surface Mounted Cast Metal Box: NEMA 250, Type 4; flat-flanged, surface mounted junction box:

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Box Locations:
 - 1. Locate boxes to be accessible. Provide access panels in accordance with Section 08 31 00 as required where approved by the Architect.
 - 2. Unless dimensioned, box locations indicated are approximate.
 - 3. Locate boxes as required for devices installed under other sections or by others.
 - a. Switches, Receptacles, and Other Wiring Devices: Comply with Section 26 27 26.
 - b. Communications Systems Outlets: Comply with Section 27 10 00.
 - 4. Locate boxes so that wall plates do not span different building finishes.
 - 5. Locate boxes so that wall plates do not cross masonry joints.
 - 6. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
 - 7. Do not install flush-mounted boxes on opposite sides of walls back-to-back. Provide minimum 6 inches horizontal separation unless otherwise indicated.
 - 8. Acoustic-Rated Walls: Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches horizontal separation.
 - 9. Fire Resistance Rated Walls: Install flush-mounted boxes such that the required fire resistance will not be reduced.
 - a. Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches separation where wall is constructed with individual noncommunicating stud cavities or protect both boxes with listed putty pads.
 - b. Do not install flush-mounted boxes with area larger than 16 square inches or such that the total aggregate area of openings exceeds 100 square inches for any 100 square feet of wall area.
 - 10. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points in accordance with Section 26 05 33.13.
- E. Box Supports:
 - 1. Secure and support boxes in accordance with NFPA 70 and Section 26 05 29 using suitable supports and methods approved by the authority having jurisdiction.
 - 2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
- F. Install boxes plumb and level.
- G. Flush-Mounted Boxes:
 - 1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface

- more than 1/4 inch or does not project beyond finished surface.
2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
 3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch at the edge of the box.
- H. Install boxes as required to preserve insulation integrity.
- I. Underground Boxes/Enclosures:
1. Install enclosure on gravel base, minimum 6 inches deep.
 2. Install additional bracing inside enclosures in accordance with manufacturer's instructions to minimize box sidewall deflections during backfilling. Backfill with cover bolted in place.
- J. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- K. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.
- L. Close unused box openings.
- M. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.
- N. Provide grounding and bonding in accordance with Section 26 05 26.
- O. Coordinate installation of outlet boxes for equipment connected under Section 26 2717.
- P. Set wall mounted boxes at elevations to accommodate mounting heights indicated.
- Q. Electrical boxes are shown on Drawings in approximate locations unless dimensioned.
1. Adjust box locations up to 10 feet if required to accommodate intended purpose.
- R. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- S. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- T. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.
- U. Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes.
- V. Locate outlet boxes to allow luminaires positioned as shown on reflected ceiling plan.
- W. Use flush mounting outlet box in finished areas.
- X. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- Y. Provide separate boxes for emergency power and normal power systems.
- Z. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.
- AA. Locate outlet boxes so that wall plates do not span different building finishes.
- BB. Locate outlet boxes so that wall plates do not cross masonry joints.
- CC. Do not install flush mounting box back-to-back in walls; provide minimum 6 inches separation.
1. Provide minimum 24 inches separation in acoustic rated walls.
 2. Provide minimum 24 inches separation in fire rated walls.
- DD. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
- EE. Use stamped steel bridges to fasten flush mounting outlet box between studs.
- FF. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- GG. Use adjustable steel channel fasteners for hung ceiling outlet box.

HH. Do not fasten boxes to ceiling support wires.

II. Use gang box with plaster ring for single device outlets.

JJ. Use cast outlet box in exterior locations exposed to the weather and wet locations.

KK. Identify boxes in accordance with Section 26 0553.

3.02 ADJUSTING

A. Adjust flush-mounting outlets to make front flush with finished wall material.

B. Install knockout closures in unused box openings.

3.03 CLEANING

A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

B. Clean exposed surfaces and restore finish.

END OF SECTION

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Electrical identification requirements.
- B. Identification nameplates and labels.
- C. Wire and cable markers.
- D. Underground warning tape.
- E. Floor marking tape.
- F. Warning signs and labels.

1.02 RELATED REQUIREMENTS

- A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Color coding for power conductors and cables 600 V and less; vinyl color coding electrical tape.

1.03 REFERENCE STANDARDS

- A. ANSI Z535.2 - American National Standard for Environmental and Facility Safety Signs; 2011 (Reaffirmed 2017).
- B. ANSI Z535.4 - American National Standard for Product Safety Signs and Labels; 2011 (Reaffirmed 2017).
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. UL 969 - Marking and Labeling Systems; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.
- B. Sequencing:
 - 1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.
 - 2. Do not install identification products until final surface finishes and painting are complete.

1.05 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.

1.06 FIELD CONDITIONS

- A. Do not install adhesive products when ambient temperature is lower than recommended by manufacturer.

PART 2 PRODUCTS

2.01 IDENTIFICATION REQUIREMENTS

- A. Identification for Equipment:
 - 1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
 - a. Switchgear:
 - 1) Identify ampere rating.
 - 2) Identify voltage and phase.
 - 3) Identify power source and circuit number. Include location when not within sight of equipment.
 - 4) Use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.

- b. Panelboards:
 - 1) Identify power source and circuit number. Include location when not within sight of equipment.
 - 2) Use typewritten circuit directory to identify load(s) served for panelboards with a door. Identify spares and spaces using pencil.
 - 3) For power panelboards without a door, use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.
- c. Enclosed switches, circuit breakers, and motor controllers:
 - 1) Identify power source and circuit number. Include location when not within sight of equipment.
 - 2) Identify load(s) served. Include location when not within sight of equipment.
- d. Time Switches:
 - 1) Identify load(s) served and associated circuits controlled. Include location.
- e. Electricity Meters:
 - 1) Identify load(s) or apartment/comercial space metered.
- 2. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70 including but not limited to the following.
 - a. Service equipment.
 - 3. Arc Flash Hazard Warning Labels: Use warning labels to identify arc flash hazards for electrical equipment, such as switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are likely to require examination, adjustment, servicing, or maintenance while energized.
 - a. Minimum Size: 3.5 by 5 inches.
- B. Identification for Conductors and Cables:
 - 1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 05 19.
 - 2. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.
- C. Identification for Boxes:
 - 1. Use identification labels or handwritten text using indelible marker to identify circuits enclosed.
 - a. For exposed boxes in public areas, use only identification labels.
- D. Identification for Devices:
 - 1. Use identification label or engraved wallplate to identify load controlled for wall-mounted control devices controlling loads that are not visible from the control location and for multiple wall-mounted control devices installed at one location.
 - 2. Use identification label to identify receptacles protected by upstream GFI protection, where permitted.

2.02 IDENTIFICATION NAMEPLATES AND LABELS

- A. Identification Nameplates:
 - 1. Manufacturers:
 - a. Brimar Industries, Inc: www.brimar.com.
 - b. Kolbi Pipe Marker Co: www.kolbipipemarkers.com.
 - c. Seton Identification Products: www.seton.com.
 - 2. Materials:

- a. Indoor Clean, Dry Locations: Use plastic nameplates.
 - b. Outdoor Locations: Use plastic, stainless steel, or aluminum nameplates suitable for exterior use.
 3. Plastic Nameplates: Two-layer or three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch; engraved text.
 4. Stainless Steel Nameplates: Minimum thickness of 1/32 inch; engraved or laser-etched text.
 5. Aluminum Nameplates: Anodized; minimum thickness of 1/32 inch; engraved or laser-etched text.
 6. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch high; Four, located at corners for larger sizes.
- B. Identification Labels:
1. Manufacturers:
 - a. Brady Corporation: www.bradyid.com.
 - b. Brother International Corporation: www.brother-usa.com.
 - c. Panduit Corp: www.panduit.com.
 2. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
 3. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.

2.03 WIRE AND CABLE MARKERS

- A. Manufacturers:
1. Brady Corporation: www.bradyid.com.
 2. HellermannTyton: www.hellermanntyton.com.
 3. Panduit Corp: www.panduit.com.
- B. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl cloth, wrap-around self-adhesive vinyl self-laminating, heat-shrink sleeve, plastic sleeve, plastic clip-on, or vinyl split sleeve type markers suitable for the conductor or cable to be identified.
- C. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.
- D. Legend: Power source and circuit number or other designation indicated.
- E. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.
- F. Minimum Text Height: 1/8 inch.
- G. Color: Black text on white background unless otherwise indicated.

2.04 VOLTAGE MARKERS

- A. Manufacturers:
1. Brady Corporation: www.bradyid.com.
 2. Brimar Industries, Inc: www.brimar.com.
 3. Seton Identification Products: www.seton.com.
- B. Minimum Size:
- C. Legend:
- D. Color: Black text on orange background unless otherwise indicated.

2.05 FLOOR MARKING TAPE

- A. Manufacturers:
1. Brady Corporation: www.bradyid.com.
 2. Brimar Industries, Inc: www.brimar.com.

3. Seton Identification Products: www.seton.com.

B. Floor Marking Tape for Equipment Working Clearance Identification: Self-adhesive vinyl or polyester tape with overlamine, 3 inches wide, with alternating black and white stripes.

2.06 WARNING SIGNS AND LABELS

A. Manufacturers:

1. Brimar Industries, Inc: www.brimar.com.
2. Clarion Safety Systems, LLC: www.clarionsafety.com.
3. Seton Identification Products: www.seton.com.

B. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.

C. Warning Signs:

1. Materials:
2. Minimum Size: 7 by 10 inches unless otherwise indicated.

D. Warning Labels:

1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
3. Minimum Size: 2 by 4 inches unless otherwise indicated.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:

1. Surface-Mounted Equipment: Enclosure front.
2. Flush-Mounted Equipment: Inside of equipment door.
3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
4. Elevated Equipment: Legible from the floor or working platform.
5. Branch Devices: Adjacent to device.
6. Interior Components: Legible from the point of access.
7. Boxes: Outside face of cover.
8. Conductors and Cables: Legible from the point of access.
9. Devices: Outside face of cover.

C. Install identification products centered, level, and parallel with lines of item being identified.

D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.

1. Do not use adhesives on exterior surfaces except where substrate cannot be penetrated.

E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.

F. Secure rigid signs using stainless steel screws.

G. Mark all handwritten text, where permitted, to be neat and legible.

3.02 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.

Lucas Metropolitan Housing
LMHA Task Order #2 - Richmar Manor
Issuance - PERMIT REVISIONS

Hooker DeJong, Inc.
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END OF SECTION

SECTION 26 05 83 - WIRING CONNECTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Electrical connections to equipment.

1.02 RELATED REQUIREMENTS

- A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables.
- B. Section 26 05 33.13 - Conduit for Electrical Systems.
- C. Section 26 05 33.16 - Boxes for Electrical Systems.
- D. Section 26 27 26 - Wiring Devices.
- E. Section 26 28 16.16 - Enclosed Switches.
- F. Section 26 29 13 - Enclosed Controllers.

1.03 REFERENCE STANDARDS

- A. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (Reaffirmed 2020).
- B. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2021.
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.
 - 2. Determine connection locations and requirements.
- B. Sequencing:
 - 1. Install rough-in of electrical connections before installation of equipment is required.
 - 2. Make electrical connections before required start-up of equipment.

1.05 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Products: Listed, classified, and labeled as suitable for the purpose intended.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Cords and Caps: NEMA WD 6; match receptacle configuration at outlet provided for equipment.
 - 1. Colors: Comply with NEMA WD 1.
 - 2. Cord Construction: NFPA 70, Type SO, multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.
 - 3. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.
- B. Disconnect Switches: As specified in Section 26 28 16.16 and in individual equipment sections.
- C. Wiring Devices: As specified in Section 26 27 26.
- D. Flexible Conduit: As specified in Section 26 05 33.13.
- E. Wire and Cable: As specified in Section 26 05 19.
- F. Boxes: As specified in Section 26 05 33.16.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that equipment is ready for electrical connection, wiring, and energization.

3.02 ELECTRICAL CONNECTIONS

- A. Make electrical connections in accordance with equipment manufacturer's instructions.
- B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.
- C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.
- D. Provide receptacle outlet to accommodate connection with attachment plug.
- E. Provide cord and cap where field-supplied attachment plug is required.
- F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.
- G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.
- H. Install terminal block jumpers to complete equipment wiring requirements.
- I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

END OF SECTION

SECTION 26 56 00 - EXTERIOR LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Exterior luminaires.
- B. Poles and accessories.
- C. Luminaire accessories.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Materials and installation requirements for concrete bases for poles.
- B. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
- C. Section 26 05 29 - Hangers and Supports for Electrical Systems.
- D. Section 26 05 33.16 - Boxes for Electrical Systems.
- E. Section 26 09 19 - Enclosed Contactors: Lighting contactors.
- F. Section 26 09 23 - Lighting Control Devices: Automatic controls for lighting including outdoor motion sensors, time switches, and outdoor photo controls.
- G. Section 26 27 26 - Wiring Devices: Receptacles for installation in poles.
- H. Section 26 28 13 - Fuses.

1.03 REFERENCE STANDARDS

- A. IEEE C2 - National Electrical Safety Code(R) (NESC(R)); 2023.
- B. IES LM-63 - Approved Method: IES Standard File Format for the Electronic Transfer of Photometric Data and Related Information; 2019.
- C. IESNA LM-63 - ANSI Approved Standard File Format for Electronic Transfer of Photometric Data and Related Information; 2002 (Reaffirmed 2008).
- D. IES LM-79 - Approved Method: Optical and Electrical Measurements of Solid-State Lighting Products; 2019.
- E. IES LM-79 - Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products; Illuminating Engineering Society; 2008.
- F. IES LM-80 - Approved Method: Measuring Maintenance of Light Output Characteristics of Solid-State Light Sources; 2021.
- G. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
- H. NECA/IESNA 501 - Standard for Installing Exterior Lighting Systems; 2000 (Reaffirmed 2006).
- I. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility; 2012 (Reaffirmed 2018).
- J. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- K. UL 935 - Fluorescent-Lamp Ballasts; Current Edition, Including All Revisions.
- L. UL 1598 - Luminaires; Current Edition, Including All Revisions.
- M. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:

1. Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
 2. Provide photometric calculations where luminaires are proposed for substitution upon request.
 3. Provide structural calculations for each pole proposed for substitution.
- C. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, weight, effective projected area (EPA), and installed accessories; include model number nomenclature clearly marked with all proposed features.
1. LED Luminaires:
 - a. Include estimated useful life, calculated based on IES LM-80 test data.
 2. Provide electronic files of photometric data certified by a National Voluntary Laboratory Accreditation Program (NVLAP) lab or independent testing agency in IES LM-63 standard format upon request.
 3. Lamps: Include rated life and initial and mean lumen output.
 4. Poles: Include information on maximum supported effective projected area (EPA) and weight for the design wind speed.
- D. Certificates for Poles and Accessories: Manufacturer's documentation that products are suitable for the luminaires to be installed and comply with designated structural design criteria.
- E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. See Section 01 60 00 - Product Requirements, for additional provisions.
- G. Project Record Documents: Record actual connections and locations of pole foundations, luminaires, and any pull or junction boxes.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, handle, and store products according to NECA/IESNA 501 and manufacturer's written instructions.
- B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

PART 2 PRODUCTS

2.01 LUMINAIRES

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products that are listed and labeled as complying with UL 1598, where applicable.
- C. Provide products listed, classified, and labeled as suitable for the purpose intended.
- D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.
- E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, poles, foundations, supports, trims, accessories, etc. as necessary for a complete operating system.

- F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.
- G. Provide luminaires listed and labeled as suitable for wet locations unless otherwise indicated.
- H. Recessed Luminaires:
 - 1. Ceiling Compatibility: Comply with NEMA LE 4.
 - 2. Luminaires Recessed in Insulated Ceilings: Listed and labeled as IC-rated, suitable for direct contact with insulation and combustible materials.
 - 3. Luminaires Recessed in Sloped Ceilings: Provide suitable sloped ceiling adapters.
- I. LED Luminaires:
 - 1. Components: UL 8750 recognized or listed as applicable.
 - 2. Tested in accordance with IES LM-79 and IES LM-80.
 - 3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.
- J. LED Luminaire Components: UL 8750 recognized or listed as applicable.
- K. Exposed Hardware: Stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated on the drawings.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
- C. Verify that suitable support frames are installed where required.
- D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

- A. Coordinate locations of outlet boxes provided under Section 26 05 33.16 as required for installation of luminaires provided under this section.
- B. Install products in accordance with manufacturer's instructions.
- C. Install luminaires in accordance with NECA/IESNA 501.
- D. Provide required support and attachment in accordance with Section 26 05 29.
- E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
- F. Recessed Luminaires:
 - 1. Install trims tight to mounting surface with no visible light leakage.
 - 2. Non-IC Rated Luminaires: Maintain required separation from insulation and combustible materials according to listing.
 - 3. Luminaires Recessed in Fire-Rated Ceilings: Install using accessories and firestopping materials to meet regulatory requirements for fire rating.
- G. Suspended Luminaires:
 - 1. Unless otherwise indicated, specified mounting heights are to bottom of luminaire.
 - 2. Install using the suspension method indicated, with support lengths and accessories as required for specified mounting height.

3. Provide minimum of two supports for each luminaire equal to or exceeding 4 feet in length, with no more than 4 feet between supports.
 4. Install canopies tight to mounting surface.
 5. Unless otherwise indicated, support pendants from swivel hangers.
 - H. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to center of luminaire.
 - I. Pole-Mounted Luminaires:
 1. Maintain the following minimum clearances:
 - a. Comply with IEEE C2.
 - b. Comply with utility company requirements.
 2. Foundation-Mounted Poles:
 - a. Provide cast-in-place concrete foundations for poles as indicated, in accordance with Section 03 30 00.
 - 1) Install anchor bolts plumb per template furnished by pole manufacturer.
 - 2) Position conduits to enter pole shaft.
 - b. Install foundations plumb.
 - c. Install poles plumb, using leveling nuts or shims as required to adjust to plumb.
 - d. Tighten anchor bolt nuts to manufacturer's recommended torque.
 - e. Install anchor base covers or anchor bolt covers as indicated.
 3. Grounding:
 - a. Bond luminaires, metal accessories, metal poles, and foundation reinforcement to branch circuit equipment grounding conductor.
 4. Install separate service conductors, 12 AWG copper, from each luminaire down to handhole for connection to branch circuit conductors.
 - J. Install accessories furnished with each luminaire.
 - K. Bond products and metal accessories to branch circuit equipment grounding conductor.
 - L. Install lamps in each luminaire.
- 3.04 FIELD QUALITY CONTROL
- A. See Section 01 40 00 - Quality Requirements, for additional requirements.
 - B. Inspect each product for damage and defects.
 - C. Operate each luminaire after installation and connection to verify proper operation.
 - D. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect.
 - E. Measure illumination levels at night with calibrated meters to verify compliance with performance requirements. Record test results in written report to be included with submittals.
- 3.05 ADJUSTING
- A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect. Secure locking fittings in place.
 - B. Luminaires with Field-Rotatable Optics: Position optics according to manufacturer's instructions to achieve lighting distribution as indicated or as directed by Architect.
- 3.06 CLEANING
- A. Clean surfaces according to NECA/IESNA 501 and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.
- 3.07 CLOSEOUT ACTIVITIES
- A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.
 - B. Just prior to Substantial Completion, replace all lamps that have failed.

3.08 PROTECTION

- A. Protect installed luminaires from subsequent construction operations.

END OF SECTION

SECTION 32 12 16 - ASPHALT PATCHING AND PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Bituminous concrete paving.

1.02 RELATED REQUIREMENTS

- A. Section 31 22 00 - Grading: Preparation of site for paving and base.
- B. Section 31 23 23 - Fill: Compacted subgrade for paving.
- C. Section 32 11 23 - Aggregate Base Courses: Aggregate base course.
- D. Section 32 13 13 - Concrete Paving: Concrete curbs.
- E. Section 09 90 00 - Painting and Coating: Pavement markings.

1.03 REFERENCE STANDARDS

- A. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types; The Asphalt Institute; 1997.
- B. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction; 2009a.
- C. Ohio Department Of Transportation (ODOT) Construction and Material Specifications.

1.04 QUALITY ASSURANCE

- A. Perform Work in accordance with Ohio Department of Transportation Standards.
- B. Mixing Plant: Conform to Ohio Department of Transportation Standards.
- C. Obtain materials from same source throughout.

1.05 REGULATORY REQUIREMENTS

- A. Conform to applicable code for paving work on public property.

1.06 FIELD CONDITIONS

- A. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen.
- B. Place bitumen mixture when temperature is not more than 15 F degrees below bitumen supplier's bill of lading and not more than maximum specified temperature.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Asphalt Cement: ASTM D946.
- B. Aggregate for Base Course: In accordance with ODOT standards.
- C. Aggregate for Binder Course: In accordance with ODOT standards.
- D. Aggregate for Wearing Course: In accordance with ODOT standards.
- E. Fine Aggregate: In accordance with ODOT standards.
- F. Primer: In accordance with ODOT standards.
- G. Tack Coat: In accordance with ODOT standards.

2.02 ASPHALT PAVING MIXES AND MIX DESIGN

- A. Leveling Course: Mix 3C, LVSP, or 13A - ODOT standards.
- B. Wearing Course: Mix 13A, 36A, or LVSP - ODOT standards.

2.03 SOURCE QUALITY CONTROL

- A. Test mix design and samples in accordance with AI MS-2.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that compacted subgrade is dry and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.

3.02 BASE COURSE

- A. Place and compact base course.

3.03 PREPARATION - PRIMER

- A. Apply primer in accordance with manufacturer's instructions.
- B. Apply primer on aggregate base or subbase at uniform rate of 1/3 gal/sq yd.
- C. Use clean sand to blot excess primer.

3.04 PREPARATION - TACK COAT

- A. Apply tack coat in accordance with manufacturer's instructions.
- B. Apply tack coat on asphalt or concrete surfaces over subgrade surface at uniform rate of 1/3 gal/sq yd.

3.05 PLACING ASPHALT PAVEMENT

- A. Place asphalt binder course within 24 hours of applying primer or tack coat.
- B. Place binder course to compacted thickness specified on plans.
- C. Place wearing course within two hours of placing and compacting binder course.
- D. Place wearing course to compacted thickness specified on plans.
- E. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
- F. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.06 TOLERANCES

- A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- B. Variation from True Elevation: Within 1/2 inch.

3.07 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for general requirements for quality control.
- B. Provide field inspection and testing. Take samples and perform tests in accordance with AI MS-2.

3.08 PROTECTION

- A. Immediately after placement, protect pavement from mechanical injury for two days or until surface temperature is less than 140 degrees F.

END OF SECTION

SECTION 32 13 13 - CONCRETE PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete sidewalks, stair steps, integral curbs, gutters, median barriers, parking areas, and roads.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete.
- B. Section 31 22 00 - Grading: Preparation of site for paving and base and preparation of subsoil at pavement perimeter for planting.
- C. Section 32 17 26 - Tactile Warning Surfacing: Plastic tactile and detectable warning tiles for pedestrian walking surfaces.

1.03 REFERENCE STANDARDS

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International; 1991 (Reapproved 2009).
- B. ACI 301 - Specifications for Structural Concrete; American Concrete Institute International; 2010 (Errata 2012).
- C. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International; 2000.
- D. ACI 305R - Hot Weather Concreting; American Concrete Institute International; 2010.
- E. ACI 306R - Cold Weather Concreting; American Concrete Institute International; 2010.
- F. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2015.
- G. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2015.
- H. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2013.
- I. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2014.
- J. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2015.
- K. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.
- L. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2014.
- M. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2011.
- N. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2014.
- O. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).
- P. ASTM D1752 - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction; 2004a (Reapproved 2013).
- Q. Ohio Department of Transportation (ODOT) Construction and Material Specifications

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on joint filler, admixtures, and curing compound.
- C. Design Data: Indicate pavement thickness, Mix design, designed concrete strength, reinforcement, accessories, and typical details.

PART 2 PRODUCTS

2.01 PAVING ASSEMBLIES

- A. Comply with applicable requirements of ACI 301.
- B. Concrete Sidewalks: 4,000 psi 28 day concrete, 4 inches thick.
- C. Concrete Dumpster Pad: 4,000 psi 28 day concrete, 6 inches thick, with 6x6 W2.9xW2.9 WWF, wood float finish.

2.02 FORM MATERIALS

- A. Form Materials: Conform to ACI 301.
- B. Joint Filler: Preformed; non-extruding bituminous type (ASTM D1751) or sponge rubber or cork (ASTM D1752).
 - 1. Thickness: 1/2 inch.

2.03 REINFORCEMENT

- A. Steel Welded Wire Reinforcement: Plain type, ASTM A1064/A1064M; in flat sheets; unfinished.
- B. Dowels: ASTM A615/A615M, Grade 40 - 40,000 psi yield strength; deformed billet steel bars; unfinished finish.

2.04 CONCRETE MATERIALS

- A. Concrete Materials: As specified in Section 03 30 00.

2.05 ACCESSORIES

- A. Curing Compound: ASTM C309, Type 1, Class A.
- B. Tactile Warning Surfaces: See Section 32 17 26.

2.06 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
 - 1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- C. Adjustment to Concrete Mixes: Mix design adjustments may be requested by contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as submitted to and accepted by Architect before using in work. D. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.

2.07 MIXING

- A. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.
- C. Verify that expansion joint material, anchors and other embedded items are secured in position.

3.02 SUBBASE

3.03 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.

32 13 13 - 2

CONCRETE PAVING

- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.04 REINFORCEMENT

- A. Place reinforcement at midheight of slabs-on-grade.
- B. Interrupt reinforcement at contraction joints.
- C. Place dowels to achieve pavement and curb alignment as detailed.

3.05 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.

3.06 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. Ensure reinforcement, inserts, embedded parts, formed joints and forms 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.

3.07 JOINTS

- A. Align curb, gutter, and sidewalk joints.
- B. Place 3/8 inch wide expansion joints at 20 foot intervals and to separate paving from vertical surfaces and other components and in pattern indicated.
 - 1. Form joints with joint filler extending from bottom of pavement to within 1/2 inch of finished surface.
- C. Saw cut contraction joints 3/16 inch wide at an optimum time after finishing. Cut 1/3 into depth of slab.

3.08 FINISHING

- A. Area Paving: Light broom, texture perpendicular to pavement direction.
- B. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radiused edge 1/4 inch radius.
- C. Curbs and Gutters: Light broom, texture parallel to pavement direction.
- D. Inclined Vehicular Ramps: Broomed perpendicular to slope.
- E. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.09 JOINT SEALING

- A. See Section 07 90 05 for joint sealer requirements.

3.10 TOLERANCES

32 13 13 - 3

CONCRETE PAVING

- A. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.
- B. Maximum Variation From True Position: 1/4 inch.

3.11 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.
 - 1. Provide free access to concrete operations at project site and cooperate with appointed firm.
 - 2. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
 - 3. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
- B. Compressive Strength Tests: ASTM C39/C39M; for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cu yd or less of each class of concrete placed.
 - 1. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
 - 2. Perform one slump test for each set of test cylinders taken.
- C. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.12 PROTECTION

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.
- B. Do not permit pedestrian traffic over pavement for 7 days minimum after finishing.

END OF SECTION

Lucas Metropolitan Housing
LMHA Task Order #2 – Richmar Manor
Issuance – PERMIT REVISIONS

Hooker DeJong, Inc.
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32 13 13 - 4
CONCRETE PAVING

32 13 13 - 5
CONCRETE PAVING

SECTION 32 17 23.13 - PAINTED PAVEMENT MARKINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Parking lot markings, including parking bays, crosswalks, arrows, handicapped symbols, and curb markings.

1.02 RELATED REQUIREMENTS

- A. Section 32 12 16 - Asphalt Paving.
- B. Section 32 17 26 - Tactile Warning Surfacing: Plastic tactile and detectable warning tiles for pedestrian walking surfaces.

1.03 REFERENCE STANDARDS

- A. FS TT-P-1952 - Paint, Traffic Black, and Airfield Marking, Waterborne; Rev. E, 2007.
- B. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; current edition, www.paintinfo.com.
- C. FHWA MUTCD - Manual on Uniform Traffic Control Devices for Streets and Highways; U.S. Department of Transportation, Federal Highway Administration; Current Edition.

1.04 SUBMITTALS

- A. See Section 01 30 00 - 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. Installation methods.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver paint in containers of at least 5 gallons accompanied by batch certificate.
- B. Store products in manufacturer's unopened packaging until ready for installation.
- C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.06 FIELD CONDITIONS

- A. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Line and Zone Marking Paint: MPI No. 97 Latex Traffic Marking Paint; color(s) as indicated.
 - 1. Parking Lots: Yellow.
 - 2. Handicapped Symbols: Blue.
- B. Line and Zone Marking Paint: Refer to Section 09 90 00.
- C. Tactile Warning Surfaces: See Section 32 17 26.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Allow new pavement surfaces to cure for a period of not less than 14 days before application of marking materials.

- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions. C. Clean surfaces thoroughly prior to installation.
 - 1. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods.
- D. Where oil or grease are present, scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application; after cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through the new paint.
- E. Establish survey control points to determine locations and dimensions of markings; provide templates to control paint application by type and color at necessary intervals.

3.03 INSTALLATION

- A. Begin pavement marking as soon as practicable after surface has been cleaned and dried.
- B. Do not apply paint if temperature of surface to be painted or the atmosphere is less than 50 degrees F or more than 95 degrees F.
- C. Apply in accordance with manufacturer's instructions using an experienced technician that is thoroughly familiar with equipment, materials, and marking layouts.
- D. Comply with FHWA MUTCD manual (<http://mutcd.fhwa.dot.gov>) for details not shown.
- E. Apply markings in locations determined by measurement from survey control points; preserve control points until after markings have been accepted.
- F. Apply uniformly painted markings of color(s), lengths, and widths as indicated on the drawings true, sharp edges and ends.
 - 1. Apply paint in one coat only.
 - 2. Wet Film Thickness: 0.015 inch, minimum.
 - 3. Width Tolerance: Plus or minus 1/8 inch.
- G. Parking Lots: Apply parking space lines, entrance and exit arrows, painted curbs, and other markings indicated on drawings.
 - 1. Mark the International Handicapped Symbol at indicated parking spaces.
 - 2. Hand application by pneumatic spray is acceptable.
- H. Symbols: Use a suitable template that will provide a pavement marking with true, sharp edges and ends, of the design and size indicated.

3.04 DRYING, PROTECTION, AND REPLACEMENT

- A. Protect newly painted markings so that paint is not picked up by tires, smeared, or tracked. B. Provide barricades, warning signs, and flags as necessary to prevent traffic crossing newly painted markings.
- C. Allow paint to dry at least the minimum time specified by the applicable paint standard and not less than that recommended by the manufacturer.
- D. Remove and replace markings that are applied at less than minimum material rates; deviate from true alignment; exceed length and width tolerances; or show light spots, smears, or other deficiencies or irregularities.
- E. Remove markings in manner to avoid damage to the surface to which the marking was applied, using carefully controlled sand blasting, approved grinding equipment, or other approved method.
- F. Replace removed markings at no additional cost to Owner.
- C. **END OF SECTION**

SECTION 32 17 26 - TACTILE WARNING SURFACING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Plastic tactile and detectable warning tiles for pedestrian walking surfaces.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Concrete for sidewalks and platforms.
- B. Section 32 13 13 - Portland Cement Concrete Paving: Concrete sidewalks.

1.03 REFERENCE STANDARDS

- A. 36 CFR 1191 - Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities; Final Rule; current edition (ADAAG).
- B. 49 CFR 37 - Transportation Services for Individuals with Disabilities (ADA); current edition.
- C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- D. ATBCB PROWAG - Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way; 2011.
- E. FED-STD-595C - Colors Used in Government Procurement (Fan Deck); 2008 (Chg Notice 1).

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturer's product data, standard details, details specific to this project; written installation and maintenance instructions.
- C. Warranty: Submit manufacturer warranty; complete forms in Owner's name and register with manufacturer.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company certified in writing by product manufacturer as having successfully completed work substantially similar to the work of this section.

1.06 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Plastic Tiles: Provide manufacturer's standard five year warranty against manufacturing defects, breakage or deformation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Plastic Tactile and Detectable Warning Surface Tiles:
 - 1. ADA Solutions, Inc; _____: www.adatile.com.
 - 2. Engineered Plastics, Inc..
 - 3. DetecTile Corporation.
 - 4. AlertTiles
 - 5. Access Products, Inc.

2.02 TACTILE AND DETECTABLE WARNING TILES

- A. Plastic Tactile and Detectable Warning Tiles: ADAAG compliant, glass fiber and carbon fiber reinforced, exterior grade, matte finish polyester sheet with truncated dome pattern, solid color throughout, internal reinforcing of sheet and of truncated domes, integral radius cut lines on back face of tile; with factory applied removable protective sheeting.
 - 1. Shape: Rectangular.
 - 2. Dimensions: 24 inches by 48 inches.
 - 3. Pattern: In-line pattern of truncated domes complying with ADAAG.
 - 4. Color: FED-STD 595C, Table IV, Federal Yellow No. 33538.

5. Products:
 - a. Access Tile, a brand of Access Products, Inc; Cast in Place Replaceable Tactile Warning Tile: www.accesstile.com.
 - b. Engineered Plastics Inc.; Armor Tile Cast in Place Composite.
 - c. DetecTile Corporation; DetecTile Replaceable Tactile Panel
 - d. AlertTiles; AlertCast
 - e. Access Products, Inc.; Access Tile Cast In Place Replaceable

2.03 ACCESSORIES

- A. Fasteners: ASTM A666, Type 304 stainless steel
 1. Type: Countersunk, color matched composite sleeve anchors
 2. Size: 1/4 inch diameter and 1-1/2 inches long.

PART 3 EXECUTION

3.01 EXAMINATION

- A. When installation location is near site boundary or property line, verify required location using property survey.
- B. Verify that work area is ready to receive work:
 1. If existing conditions are not as required to properly complete the work of this section, notify Architect.
 2. Do not proceed with installation until deficiencies in existing conditions have been corrected.
- C. Verify that dimensions, tolerances, and attachment methods for work in this section are properly coordinated with other work on site.

3.02 INSTALLATION, GENERAL

- A. Install in accordance with manufacturer's written instructions.
 1. Do not install damaged, warped, bowed, dented, abraded, or otherwise defective units.
 2. Do not install when ambient or substrate temperature has been below 40 degrees F during the preceding 8 daylight hours.
- B. Field Adjustment:
 1. Locate relative to curb line in compliance with PROWAG, Sections 304 and 305.
 2. Orient so dome pattern is aligned with the direction of ramp.
- C. Install units fully seated to substrate, square to straight edges and flat to required slope.

3.03 CLEANING PLASTIC UNITS

- A. Remove protective plastic sheeting within 24 hours of installation.
- B. Remove excess sealant or adhesive from joints and edges.
- C. Clean four days prior to date of scheduled inspection.
- D. Clean 4 days prior to date of scheduled inspection.

3.04 PROTECTION

- A. Protect installed units from traffic, subsequent construction operations or other imposed loads until concrete is fully cured.
- B. Touch-up, repair or replace damaged products prior to Substantial Completion.

END OF SECTION

SECTION 32 31 23 - PLASTIC FENCES AND GATES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Posts.
- B. Plastic pickets.
- C. Manual gates with related hardware.

1.02 REFERENCE STANDARDS

- A. ASTM D1784 - Standard Classification System and Basis for Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds; 2020.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on fence panels, posts, accessories, fittings and hardware.

1.04 QUALITY ASSURANCE

- A. Installer: Company with demonstrated successful experience installing similar projects and products, with not less than five years of documented experience.

1.05 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Finish Warranty: Provide 5-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 PLASTIC FENCES AND GATES

- A. PVC Posts: High-impact, UV-resistant, rigid polyvinyl chloride, complying with ASTM D1784, Class 14344B.
 - 1. Products:
 - a. Basis of Design: CertainTeed BuffTech Smooth Extruded, White www.certainteed.com
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
 - 2. Fence Style: Full privacy.
 - a. Fence Height: 6 feet.
 - b. Color: White.
 - c. Finish: Smooth.
 - 3. Line and Corner Posts: 5 by 5 inches, minimum; 0.135-inch wall thickness, 3/8-inch corner radius.
 - 4. Post Caps: Match cross section of post; 0.095-inch wall thickness, flat configuration.
- B. Fasteners: Manufacturer's standard stainless steel fasteners.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions: Verify that areas are clear of obstructions or debris and _____.

3.02 PREPARATION

- A. Removal: Obstructions or debris.

3.03 INSTALLATION

- A. Install framework and accessories in accordance with manufacturer's instructions.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch.
- B. Maximum Offset From True Position: 1 inch.

3.05 CLEANING

- A. See Section 01 74 19 - Construction Waste Management and Disposal for additional requirements.
- B. Clean jobsite of excess materials; scatter excess material from post hole excavations uniformly away from posts. Remove excess material if required.
- C. Clean fence with mild household detergent and clean water; rinse well.
- D. Touch up scratched surfaces using materials recommended by manufacturer. Match touched-up finish to factory-applied finish.

END OF SECTION

Lucas Metropolitan Housing
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SECTION 32 33 13 - SITE BICYCLE RACKS

PART 2 PRODUCTS

1.01 BICYCLE RACKS

A. Materials:

END OF SECTION

SECTION 32 92 19 - SEEDING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preparation of subsoil.
- B. Placing topsoil.
- C. Hydroseeding, mulching and fertilizer.

1.02 RELATED REQUIREMENTS

- A. Section 31 22 00 - Grading: Topsoil material.
- B. Section 31 22 00 - Grading: Preparation of subsoil and placement of topsoil in preparation for the work of this section.
- C. Section 31 23 23 - Fill: Topsoil material.

1.03 DEFINITIONS

- A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. A. Product Data, Shop Drawings, Samples: Submit seed mixes for review.
- C. Maintenance Data: Include maintenance instructions, cutting method and maximum grass height; types, application frequency, and recommended coverage of fertilizer .
- D. Maintenance Contract.

1.05 REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies for fertilizer and herbicide composition.

1.06 QUALITY ASSURANCE

- A. Qualifications of Workmen: Provide at least one person who shall be present at all times during execution of this portion of the work, who shall be thoroughly familiar with the type of materials being installed and the proper materials and methods for their installation, and who shall direct all work performed under this section.
- B. Standards:
 - 1. All seeding material shall meet or exceed the specifications of Federal, State, and County laws requiring inspection for plant disease and insect control.
- C. A pre-installation conference may be called to address concerns related to timing, seasonal concerns, weather conditions, or execution.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable. Deliver seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.
- C. Properly store all products in accordance with manufacturer's recommendations.

PART 2 PRODUCTS

2.01 SEED MIXTURE

- A. Hydro-Mulch / Drill Seeding:
 - 1. Drill seed Type "A" Mix then hydromulch over.

All hydro-mulch shall be free from noxious weeds, grade A recent crop, recleaned, and treated with appropriate fungicide at time of remixing. Deliver to the site in sealed containers with manufacturer’s guaranteed analysis. Wood fiber mulch at 2,000# per acre. All seeding including Meadow Mix shall be hydroseeded.

2. Slope stabilization seed mix shall be the following:

	Botanical Name	Common Name	PLS Ounces/ Acre
	GRASSES		
a.	Andropogon gerardii	Big Blue Stem	20.00
b.	Andropogon scoparius	Little Blue Stem	32.00
c.	Bouteloua curtipendula	Side-oats grama	3.00
d.	Elymus canadensis	Canada Wild Rye	5.00
e.	Panicum virgatum	Switch Grass	12.00
f.	Sorghastrum nutans	Indian Grass	24.00
	TEMPORARY COVER:		
g.	Agrostis alba	Redtop	16.00
h.	Avena sativa	Seed Oats	512.00
i.	Lolium multiflorum	Annual Rye	160.00
j.	Phleum pratense	Timothy	64.00

Note #1 - Seed mixes different than those specified must submit mixture data and be approved by Architect.

Note #2 - In general, hydro-seeding shall be provided where shown on drawings and in all areas disrupted by construction procedures.

3. Note #1 - Delivery of seed shall be coordinated closely with the planting time. If seeds are required to be held for more than one day, it shall be stored in a cool, dry place until it can be used.
4. Note #2 - All seed shall be scarified and/or cold/moist stratified as recommended for each particular species specified.
5. Note #3 - Acceptable plants: The seed species and seeding rates shall match the above with proof of purchase supplied to Architect and Construction Manager.
6. Note #4 - Seeds shall be supplied by J.F. New & Associates, Inc. at 219-586-3400.

2.02 SOIL MATERIALS

- A. Topsoil: Excavated from site and free of weeds.

2.03 ACCESSORIES

- A. Mulching Material: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable.
- B. Fertilizer/Lime: Provide commercial balance fertilizer delivered to the site in bags labeled with the manufacturer’s guaranteed analysis. If stored at the site, protect fertilizer from the elements at all times.
 1. Lime: High calcium pelitized lime, 20 lb. per 1,000 sq.ft. (August 1, 1997 installation).
 2. Fertilizer “A” (Starter): PAR EX 16-16-16 at 50 lbs. per 5,000 sq.ft. (410 lbs. per acre).
 3. Fertilizer “B”: PAR EX 24-4-12 at 50 lbs. per 12,000 sq.ft. (180 lbs. per acre)
- C. Erosion Fabric: North American Green SC-150 matting, or equal
- D. Crabgrass Control: (Utilize if seeding is done before June 30 in season)
 1. Starter: Tupersan wettable powder (6-8 lb/acre).

2. Maintenance: Tupersan Wettable Powder (16 lbs/acre)
- E. Weed Control: Apply Trimec or Drive as needed to control weed growth. Submit product data to Architect for review.
- F. Edging:
 1. Description: Edge all landscape beds and where shown on drawing. Edging shall be Commercial Grade aluminum edging 1/8" x 4" mill finish. Edging to be in 16'-0" sections with line stakes at 48" o.c. and splicer stakes as required.
 2. Quality/Material:
 - a. Edging to be 6063 Alloy, T-6 hardness, and to have horizontal undulations along both faces. A 1/8" horizontal locking ridge is to protrude 1/2" from the top edge and a locking tab is to be punched at each end of the 16'-0" section.
 - b. All stakes to be 6061 Alloy, T-6 hardness and to have burr's protruding back off the face of the stake.
 - c. Splicing stakes to be 14" long, 2" wide, with a 2" portion folded over, parallel to the face of the stake. The 2" folded portion to have 2 sets of punches. Line stakes to be 12-1/2" long, 1" wide, with a 2" portion folded over parallel to the face of the stake. The 2" folded over portion to have one (1) set of punches.
 3. Resource: Call PermaLoc at 1-800-356-9660 for product information and availability.
- G. Other Materials: All other materials, not specifically described, but required for a complete and proper installation, shall be as selected by the Contractor subject to the approval of the Architect/Engineer.

PART 3 EXECUTION

3.01 SEQUENCING AND SCHEDULING

- A. Coordinate all work with job site superintendent and all applicable trades.

3.02 EXAMINATION

- A. Verify that prepared soil base is ready to receive the work of this Section.
- B. Preliminary Investigations: The Contractor shall visit the site and make his own interpretation of conditions, based on his investigation of existing conditions and on soil conditions. Where underground services, utilities, structures, etc. are located on the drawings or given at the site, they are based on available records, but are not guaranteed to be complete or correct. They are merely available for assistance.

3.03 PREPARATION

- A. Prepare subgrade in accordance with Section 31 22 00.
- B. Place topsoil in accordance with Section 31 22 00.
 1. Spreading of Topsoil:
 - a. Rough grading will be performed under another contract. Landscaping Contractor will be responsible for fine grading.
 - b. Fine grading: Perform all fine grading required in planting areas, using topsoil obtained from the site. Hand rake all lawn seeded areas (Type A) removing rocks and debris over 1-1/2". Gill raking in Wildflower seeding is acceptable - remove all debris over 2".

3.04 FERTILIZING

- A. Apply fertilizer in accordance with manufacturer's instructions.
 1. Fertilizer "A": Install starter fertilizer at time of planting.
 2. Fertilizer "B": Install four (4) and again eight (8) weeks after planting.
 3. Notify Owner of future fertilizer requirements when grass has been accepted.
- B. Apply after smooth raking of topsoil and prior to roller compaction.
- C. Do not apply fertilizer at same time or with same machine as will be used to apply seed.
- D. Mix thoroughly into upper 2 inches of topsoil.

- E. Lightly water to aid the dissipation of fertilizer.

3.05 HYDROSEEDING

- A. Apply seed at a rate as specified in Section 2.01, evenly in two intersecting directions. Rake in lightly
- B. Do not hydroseed area in excess of that which can be mulched on same day.
- C. Immediately following seeding, apply mulch to a thickness of 1/8 inches. Maintain clear of shrubs and trees.
- D. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.
- E. Following germination, immediately re-seed areas without germinated seeds that are larger than 8 by 8 inches.

3.06 PROTECTION

- A. Cover seeded slopes where grade is 4 inches per foot or greater with erosion fabric. Roll fabric onto slopes without stretching or pulling.
- B. Lay fabric smoothly on surface, bury top end of each section in 6 inch deep excavated topsoil trench. Provide 12 inch overlap of adjacent rolls. Backfill trench and rake smooth, level with adjacent soil.
- C. Secure outside edges and overlaps at 36 inch intervals with stakes.
- D. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.
- E. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges minimum 6 inches.

3.07 ADJUSTING AND CLEANING

- A. Remove trash and excess materials from project site.
- B. Maintain paved areas in clean condition.
- C. Remove all barriers and signs from project site at termination of establishment period.
- D. Immediately after seeding, erect barricades and warning signs to protect seeded areas from traffic until grass is established.

3.08 MAINTENANCE

- A. Provide a separate maintenance contract for specified maintenance service.
- B. Maintain seeded areas immediately after placement until grass is well established and exhibits a vigorous growing condition.
- C. Mow grass at regular intervals to maintain at a maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at any one mowing.
- D. Neatly trim edges and hand clip where necessary.
- E. Immediately remove clippings after mowing and trimming.
- F. Water to prevent grass and soil from drying out.
- G. Roll surface to remove minor depressions or irregularities.
- H. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions. Remedy damage resulting from improper use of herbicides.
- I. Immediately reseed areas that show bare spots.
- J. Protect seeded areas with warning signs during maintenance period.

END OF SECTION