

**PROJECT MANUAL  
FOR**

**CENTRAL PARK WEST ADA IMPROVEMENTS  
OAK BROOK, ILLINOIS**

**OWNER**

OAK BROOK PARK DISTRICT  
1450 FOREST GATE ROAD  
OAK BROOK, ILLINOIS 60523

**ARCHITECT / ENGINEER**

KLUBER, INC.  
41 WEST BENTON STREET  
AURORA, ILLINOIS 60506



**BIDDING DOCUMENTS**

**SECTION 00 01 01  
PROJECT TITLE PAGE**

**PROJECT MANUAL**

**FOR**

**CENTRAL PARK WEST ADA IMPROVEMENTS**

**1500 FOREST GATE ROAD**

**OAK BROOK, ILLINOIS 60523**

**OWNER**

**OAK BROOK PARK DISTRICT**

**1450 FOREST GATE ROAD**

**OAK BROOK, ILLINOIS 60523**

**ARCHITECT / ENGINEER**

**KLUBER ARCHITECTS + ENGINEERS**

**41 W. BENTON STREET**

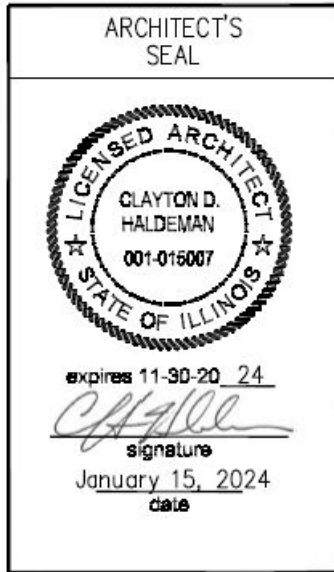
**AURORA, ILLINOIS 60506**

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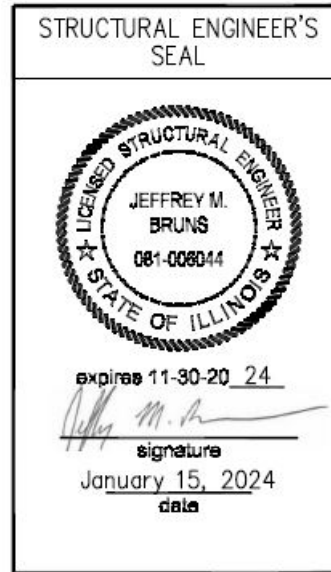
SECTION 00 01 07  
SEALS PAGE

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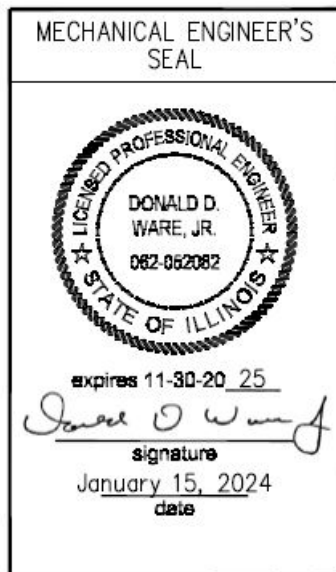
A. ARCHITECT



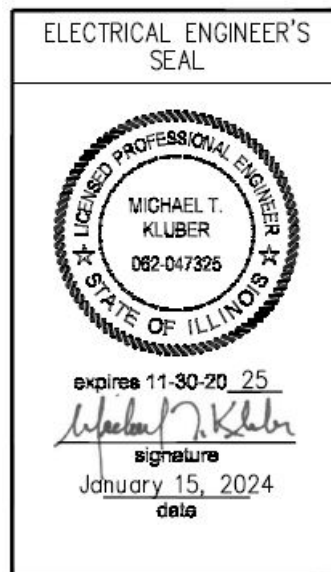
B. STRUCTURAL ENGINEER



D. MECHANICAL ENGINEER



E. ELECTRICAL ENGINEER



END OF DOCUMENT

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- G201 ACCESSIBILITY REQUIREMENTS

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- A800 DOOR, FRAME & HARDWARE, TOILET ACCESSORY SCHEDULES & EXTERIOR ELEVATIONS
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**STRUCTURAL**

- S010 GENERAL NOTES, CODE AND LOADING, TESTING AND INSPECTIONS
- S310 PARTIAL FOUNDATION, FIRST FLOOR, ATTIC & ROOF FRAMING PLANS, SECTIONS AND DETAILS
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- M310 MECHANICAL FLOOR PLANS

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- PF310 PLUMBING AND FIRE PROTECTION FLOOR PLANS

**PLUMBING**

- P410 PLUMBING RISERS, SCHEDULES AND DETAILS

**ELECTRICAL**

- E050 ELECTRICAL SYMBOLS LIST, ABBREVIATIONS, SCHEDULES & DETAILS

E310 ELECTRICAL PLANS & DETAILS

**END OF DOCUMENT**



**SECTION 00 21 13  
INSTRUCTIONS TO BIDDERS**

**SUMMARY**

AIA Document A701 (2018 Edition) - Instructions To Bidders is hereby made part of the Bidding Requirements to the same extent as if written out in full.

The above document may be examined at the Architect/Engineer's office or purchased at the American Institute of Architects, <http://www.aia.org/contractdocs/>.

**END OF DOCUMENT**

**SECTION 00 31 13  
PRELIMINARY SCHEDULE**

**1.01 GENERAL**

A. The following represents the preliminary construction schedule for the Work. This schedule is the current estimate of the Owner to be used for purposes of bidding. All Bidders shall include the costs of all overtime, double-shift, or so-called "premium" time that may be necessary to meet this milestone.

**1.02 PRELIMINARY SCHEDULE**

A. Award of Contract:	February 19, 2024
B. Commencement of Construction:	May 1, 2024
C. Substantial Completion:	August 1, 2024
D. Final Completion:	September 1, 2024

**END OF DOCUMENT**

**SECTION 01 10 00  
SUMMARY**

**PART 1 GENERAL**

**1.01 PROJECT**

- A. Project Name: CENTRAL PARK WEST ADA IMPROVEMENTS.
- B. Architect/Engineer's Name: Kluber Architects + Engineers.
- C. The Project consists of the construction of ADA multi-use accessible restroom, and two (2) single use exterior accessed restrooms.

**1.02 CONTRACT DESCRIPTION**

- A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00 52 00 - Agreement Form.

**1.03 DESCRIPTION OF ALTERATIONS WORK**

- A. Scope of demolition and removal work is indicated on drawings and specified in Section 02 41 00.
- B. Scope of alterations work is indicated on drawings.
- C. Renovate the following areas, complete including operational mechanical and electrical work and finishes:
  - 1. divide designated male restroom into two separate exterior accessed single use restrooms.
  - 2. reconfigure lobby, vestibule and reception spaces.
  - 3. reconfigure designated female restroom into multi-use, multi-sex restroom.
- D. Plumbing: Alter existing and add new construction.
- E. HVAC: Alter existing and add new construction.
- F. Electrical Power and Lighting: Alter existing and add new construction.
- G. Fire Suppression Sprinklers: Alter existing and add new construction.
- H. Contractor is required to remove and store the following prior to start of work, for later reinstallation by Contractor:
  - 1. The following specialty equipment: koala child changing stations, excellor electric hand dryer.

**1.04 WORK BY OWNER**

- A. Items noted NIC (Not in Contract) will be supplied and installed by Owner before Date of Substantial Completion.
- B. Owner will supply and install the following:
  - 1. Room Signage.
  - 2. Security camera modifications.
  - 3. Retaining walls and landscape.
- C. Owner will supply the following for installation by Contractor:

1. Select toilet accessories: toilet paper dispensers, soap dispensers .

#### **1.05 OWNER OCCUPANCY**

- A. Owner intends to not occupy portions of the existing building during the entire construction period.

#### **1.06 CONTRACTOR USE OF SITE AND PREMISES**

- A. Provide access to and from site as required by law and by Owner:
  1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
  2. Do not obstruct roadways, sidewalks, or other public ways without permit.

#### **PART 2 PRODUCTS - NOT USED**

#### **PART 3 EXECUTION - NOT USED**

**END OF SECTION**

**SECTION 01 21 00  
ALLOWANCES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Cash allowances.
- B. Contingency allowance.
- C. Payment and modification procedures relating to allowances.

**1.02 CASH ALLOWANCES**

- A. Costs Included in Cash Allowances: Cost of product to Contractor or subcontractor, less applicable trade discounts, less applicable taxes .
- B. Costs Not Included in Cash Allowances: Product delivery to site and handling at the site, including unloading, uncrating, and storage; protection of products from elements and from damage; and labor for installation and finishing. These costs are to be borne by the Contractor and are to be included in the Base Bid .
- C. Differences in costs will be adjusted by Change Order.

**1.03 CONTINGENCY ALLOWANCE**

- A. Contractor's costs for products, delivery, installation, labor, payroll, taxes and equipment rental will be included in Change Orders authorizing expenditure of funds from this Contingency Allowance.
- B. Funds will be drawn from the Contingency Allowance only by Change Order.
- C. Bond, insurance, overhead and profit fees on Change Orders paid out of Contingency Allowances will not be permitted. The Contractor must carry in its Base Bid OH&P costs on Contingency Allowance funds expenditures.
- D. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.

**1.04 ALLOWANCES SCHEDULE**

- A. Contingency Allowance: Include in the Base Bid the stipulated sum of \$45,000 for use upon Owner's instructions.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

**SECTION 01 30 00  
ADMINISTRATIVE REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. General administrative requirements.
- B. Preconstruction meeting.
- C. Site mobilization meeting.
- D. Progress meetings.
- E. Construction progress schedule.
- F. Requests for Information (RFI) procedures.
- G. Submittals for review, information, and project closeout.
- H. Number of copies of submittals.
- I. 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.
- C. Section 01 78 00 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

**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/Engineer:
  - 1. Requests for Information (RFI).
  - 2. Requests for substitution.
  - 3. Shop drawings, product data, and samples.
  - 4. Applications for payment and change order requests.
  - 5. Progress schedules.
  - 6. Correction Punch List and Final Correction Punch List for Substantial Completion.
  - 7. Closeout submittals.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 PRECONSTRUCTION MEETING**

- A. Attendance required:
  - 1. Owner.
  - 2. Architect/Engineer.

3. Contractor.

B. Agenda:

1. Execution of Owner-Contractor Agreement.
2. Submission of executed bonds and insurance certificates.
3. Distribution of Contract Documents.
4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
5. Designation of personnel representing the parties to Contract and Architect/Engineer.
6. Procedures and processing of field decisions, Submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
7. Scheduling.

C. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect/Engineer, Owner, participants, and those affected by decisions made.

### **3.02 SITE MOBILIZATION MEETING**

A. Architect/Engineer will schedule a meeting at the Project site prior to Contractor occupancy. May be combined with Preconstruction Meeting.

B. Attendance required:

1. Contractor.
2. Owner.
3. Architect/Engineer.
4. Contractor's superintendent.

C. Agenda:

1. Use of premises by Owner and Contractor.
2. Owner's requirements.
3. Construction facilities and controls provided by Owner.
4. Security and housekeeping procedures.
5. Schedules.
6. Application for payment procedures.
7. Procedures for maintaining record documents.

D. Record minutes and distribute copies within 2 days after meeting to participants, with copies to Architect/Engineer, Owner, participants, and those affected by decisions made.

### **3.03 PROGRESS MEETINGS**

A. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

B. Attendance Required:

1. Contractor.
2. Owner.
3. Architect/Engineer.
4. Contractor's superintendent.

C. 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. Maintenance of progress schedule.
7. Corrective measures to regain projected schedules.
8. Planned progress during succeeding work period.
9. Maintenance of quality and work standards.
10. Effect of proposed changes on progress schedule and coordination.
11. Other business relating to work.

D. Record minutes and distribute copies within 2 days after meeting to participants, with copies to Architect/Engineer, Owner, participants, and those affected by decisions made.

### **3.04 CONSTRUCTION PROGRES SCHEDULE**

- A. Within 7 days after date of the Agreement, submit preliminary schedule.
- B. If preliminary schedule requires revision after review, submit revised schedule within 7 days.
- C. Submit updated schedule with each Application for Payment.

### **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 an RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
  1. Prepare a separate RFI for each specific item.
    - a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
    - b. Do not forward requests which solely require internal coordination between subcontractors.
  2. Prepare in a format and with content acceptable to Owner.
    - a. Use AIA G716 - Request for Information.
  3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
- D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
  1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
  2. Unacceptable Uses for RFIs: Do not use RFIs to request the following:
    - a. Approval of submittals (use procedures specified elsewhere in this section).



- b. Approval of substitutions (see Section - 01 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/Engineer, 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/Engineer'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/Engineer will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 3:00 PM 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/Engineer within seven calendar 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/Engineer for review a schedule for submittals in tabular format.
  1. Submit at the same time as the preliminary schedule.
  2. Coordinate with Contractor's construction schedule and schedule of values.
  3. Format schedule to allow tracking of status of submittals throughout duration of construction.
  4. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
  5. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
    - a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

### **3.07 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/Engineer 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. Inspection reports.

4. Manufacturer's instructions.
5. Manufacturer's field reports.
6. Other types indicated.

B. Submit for Architect/Engineer'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.

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

### 3.10 NUMBER OF COPIES OF SUBMITTALS

A. Documents for Review:

1. Submit via email in Adobe PDF electronic file format at native sheet size and right-side up. Architect/Engineer will return via email a reviewed copy in Adobe PDF electronic file format. Files not properly sized and rotated will be rejected. Illegible files will be rejected.

B. Documents for Information: Submit via email in Adobe PDF electronic file format. Submitted documents are for Architect/Engineer's information and reference only, and will not be reviewed or returned.

C. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect/Engineer.

1. Submit original, physical samples. With each physical sample, submit Adobe PDF electronic copies of scanned physical original samples. Architect/Engineer will return via email a reviewed scanned copy in Adobe PDF electronic file format.
2. Retained samples will not be returned to Contractor unless specifically so stated.

### 3.11 SUBMITTAL PROCEDURES

A. General Requirements:

1. Use a single transmittal for related items.
2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
3. Transmit using approved form.
4. Number each submittal. Prefix the submittal number with the Specification Section number to which the submittal pertains. For revised submittals use original number and a sequential alphanumeric suffix. **Items submitted without a Specification Section number, or with an incorrect Specification Section number will delay the review process.**
5. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number, article and paragraph, as appropriate on each copy.

6. Correlate submitted items with specified products; clearly indicate the specified product that corresponds to each submitted item. **Submitted items not clearly correlated with specified items will delay the review process.**
7. When options or optional features available for a Product are indicated in a Submittal, and selections for those options/features are indicated in the Contract Documents, identify on the Submittal the selection indicated in the Contract Documents. **Submittals that fail to identify specified options or optional features may be returned marked "Rejected" or "Revise and Resubmit".**
8. 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 transmittal will not be acknowledged, reviewed, or returned.
9. 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. Deliver submittals to Architect/Engineer at business address.
10. Schedule submittals to expedite the Project, and coordinate submission of related items.
  - a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
  - b. For sequential reviews involving Architect/Engineer's consultants, Owner, or another affected party, allow an additional 7 days.
11. Clearly identify variations from the Contract Documents. Regardless of the type of variation, Contractor is solely responsible for errors in the field or performance issues that arise from Submittal variations from the requirements of the Contract Documents if those variations were not expressly noted to specifically identify for and describe to the reviewer the nature of the variation from the Contract Documents.
12. Provide space for Contractor's review stamp and a 4 inch x 3 inch clear space for Architect/Engineer's review stamp.
13. Promptly return submittals marked "Rejected" or "Revise and Resubmit" to originating subcontractor supplier, and faithfully ensure the prompt resubmittal of the correct or revised information.
14. When revised for resubmission, identify all changes made since previous submission. Use clouds, highlights or other means acceptable to Architect/Engineer. **Resubmittals that do not clearly identify all changes may be delayed and/or returned to the Contractor unreviewed.**
15. Contractor is entitled to one (1) resubmittal of each Submittal For Review or Submittal For Project Closeout rejected by Architect/Engineer or returned by Architect/Engineer for further action. Thereafter, Contractor shall pay the cost of all further Architect/Engineer reviews of any Submittal For Review or Submittal for Project Closeout, at a rate of \$200.00/hour. Cost of such further reviews will be deducted from the Contract Sum by Change Order.
16. Promptly distribute and coordinate the requirements of reviewed submittals with affected parties. Instruct parties to promptly report inability to comply with requirements.
17. Where indicated on the Drawings or in respective product specification Sections, submit reviewed submittals to Authority Having Jurisdiction (AHJ).
18. 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.
19. Submittals not requested 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. Submit concurrently with related shop drawing submittal.
  - 4. 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. Use of reproductions of the Contract Documents in digital data form to create shop drawings is only permitted as defined above under Architect/Engineer-Provided CAD Files.
  - 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. When relevant, identify each item to allow review for applicability in relation to shop drawings showing installation locations.
- E. Submittal reviews may be delayed and/or Submittals may be returned marked "Rejected" or "Revise and Resubmit" for any of the following reasons:
  - 1. Submittals submitted outside the scheduled dates of the Submittal Schedule.
  - 2. Submittals are incomplete or are missing information.
  - 3. Submittals are not submitted in accordance with procedures outlined in this Section, including, but not limited to:
    - a. Specification Section number not indicated on submittal or transmittal.
    - b. Contractor's review stamp missing.
    - c. Submitted items not correlated with specified products.
    - d. Re-submitted items not clearly identifying changes.

### **3.12 SUBMITTAL REVIEW**

- A. Submittals for Review: Architect/Engineer will review each submittal, and approve, or take other appropriate action.
- B. Submittals for Information: Architect/Engineer will not acknowledge receipt, and take no other action.
- C. Architect/Engineer's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
  - 1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.
- D. Architect/Engineer's and consultants' actions on items submitted for review:
  - 1. Authorizing purchasing, fabrication, delivery, and installation:
    - a. "No Exception Taken", or language with same legal meaning.
      - 1) Resubmission is not required or requested.
      - 2) Resubmitted items will not be acknowledged.
    - b. "Make Corrections Noted", or language with same legal meaning.
      - 1) Resubmission is not required or requested.

- 2) Resubmitted items may be returned marked "Not Requested, Not Reviewed".
2. Not Authorizing fabrication, delivery, and installation:
  - a. "Revise and Resubmit".
    - 1) Resubmit revised item, with review notations acknowledged and incorporated.
    - 2) Clearly identify all revisions.
    - 3) Non-responsive resubmittals may be rejected.
  - b. "Rejected".
    - 1) Submit item complying with requirements of Contract Documents.
  - c. "Submit Specified Item".
    - 1) Submit item complying with requirements of Contract Documents.

**END OF SECTION**

## ELECTRONIC DATA TRANSFER CONSENT FORM

Project Name: CENTRAL PARK WEST ADA IMPROVEMENTS  
1450 OAK FOREST GATE ROAD  
OAK BROOK, ILLINOIS 60523

Project No.: 23-310-1502

Owner: OAK BROOK PARK DISTRICT

Your Work: \_\_\_\_\_

KLUBER, INC. (hereinafter referred to as "Kluber") an Illinois corporation, is providing electronic data to you solely at your request and for your convenience. By accepting and opening any of the electronic data files, you agree that Kluber bears no liability for the data or its transmission to you and that you are solely liable for any and all claims referring or relating to any and all products you, or your Subcontractors, may generate with the data.

You acknowledge that you have a limited non-exclusive license to use the information solely in connection with your work on the project captioned above, and that Kluber retains all rights, including copyright, to the data.

Acknowledged by: \_\_\_\_\_  
(Printed Name) (Signature)

Company: \_\_\_\_\_

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

Architectural Floor Plans are transmitted for the contractors' use as backgrounds for shop drawings and as-built drawings, and, as such, contain graphic information for column grid, walls, floors, stairs, doors, windows, room numbers, ceiling grid, lights, diffusers and sprinkler heads where indicated on Bid Documents. Plans do not contain title blocks, keynotes, schedules, mechanical ductwork and equipment, electrical device symbols, circuit numbers and home runs, plumbing equipment, piping runs and riser diagrams, and architectural/engineering text and details. Plans depict entire floors and are not formatted, partial plans as depicted in the Bidding Documents. Files are provided in R2013 .DWG format.)

**SECTION 01 40 00  
QUALITY REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Submittals.
- B. Quality assurance.
- C. Sequencing and scheduling of the work with testing and inspections.
- D. Control of installation.
- E. Tolerances.
- F. Defect Assessment.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 41 00 - Regulatory Requirements.
- B. Section 01 42 00 - References.
- C. Section 01 60 00 - Product Requirements: Requirements for material and product quality.

**1.03 REFERENCE STANDARDS**

- A. ASTM E1155 - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers; 1996 (Reapproved 2008).
- B. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2010.
- C. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2008.
- D. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2010a.
- E. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2010b.
- F. ASTM C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile; 2009.
- G. ASTM C140 - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2011.
- H. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2010.
- I. ASTM C1148 - Standard Test Method for Measuring the Drying Shrinkage of Masonry Mortar; 1992a (Reapproved 2008) .
- J. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2010.
- K. ASTM C1357 - Standard Test Methods for Evaluating Masonry Bond Strength; 2009.



- L. ASTM E514 - Standard Test Method for Water Penetration and Leakage Through Masonry ; 2009.
- M. ASTM E165 - Standard Test Method for Liquid Penetrant Examination; 2009.

#### **1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Design Data: Submit for Architect/Engineer's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.
- C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect/Engineer, in quantities specified for Product Data.
  - 1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
  - 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect/Engineer.
- D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

#### **1.05 QUALITY ASSURANCE**

- A. Designer Qualifications: Where professional engineering design services and design data submittals are specifically required of Contractor by Contract Documents, provide services of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

#### **1.06 REGULATORY REQUIREMENTS - SEE SECTION 01 41 00**

#### **1.07 REFERENCES AND STANDARDS - SEE SECTION 01 42 00**

#### **1.08 SEQUENCING AND SCHEDULING**

- A. Soils Testing: As each portion of the Work is completed, notify testing laboratory to perform compaction and moisture density tests.
  - 1. Test compaction of existing and placed materials no more than seven (7) days prior to placement of the next portion of the Work, and only when no rain is expected between the time of the test and the placement of the next portion of the Work.
  - 2. Proceed promptly with additional portions of the Work only after satisfactory results have been verified in writing.

### **PART 2 PRODUCTS - NOT USED**

### **PART 3 EXECUTION**

#### **3.01 CONTROL OF INSTALLATION**

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

- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

### **3.02 TOLERANCES**

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

### **3.03 DEFECT ASSESSMENT**

- A. Replace Work or portions of the Work not complying with specified requirements.
- B. If, in the opinion of Owner, it is not practical to remove and replace the work, Owner will direct an appropriate remedy or adjust payment.

**END OF SECTION**

**SECTION 01 41 00  
REGULATORY REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. General.
- B. Definitions.
- C. Quality Assurance.
- D. Regulatory Requirements.

**1.02 RELATED SECTIONS**

- A. Section 01 10 00 - Summary.
- B. Section 01 42 00 - References.

**1.03 GENERAL**

- A. Comply with all applicable laws, rules, regulations, codes and ordinances.
- B. If the Contractor observes that the Contract Documents may be at variance with specified codes, notify the Architect/Engineer immediately. Architect/Engineer shall issue all changes in accordance with the General Conditions.
- C. It shall not be the Contractor's primary responsibility to make certain that the Contract Documents are in accordance with all applicable laws, rules and regulations, however, when the Contractor performs work knowing or having reason to know that the work in question is contrary to applicable laws, rules, and regulations, and fails to notify the Architect/Engineer, the Contractor shall pay all costs arising therefrom.

**1.04 DEFINITIONS**

- A. Definitions:
  - 1. Codes: Codes are statutory requirements, rules or regulations of governmental entities.
  - 2. Standards: Standards are requirements that have been established as accepted criteria, set general consent.

**1.05 QUALITY ASSURANCE**

- A. The Architect/Engineer has designed the project to applicable code requirements and has copies of said codes available for the Contractor's inspection.
- B. The Contractor shall:
  - 1. Ensure that copies of codes and standards referenced herein or specified in individual specifications sections are available to Contractor's personnel, agents, and Sub-Contractors.
  - 2. Ensure that Contractor's personnel, agents, and Sub-Contractors are familiar with the workmanship and requirements of applicable codes and standards.

**1.06 REGULATORY REQUIREMENTS**

- A. Source and Requirements: Verify amendments with local code officials.
  - 1. Local code requirements:

- a. ICC International Building Code, 2021 Edition.
  - b. ICC International Mechanical Code, 2021 Edition.
  - c. ICC International Fire Code, 2021 Edition.
  - d. ICC International Property Maintenance Code, 2021 Edition.
  - e. National Electrical Code, 2020 Edition.
2. State code requirements:
- a. Capital Development Board (CDB):
  - b. Illinois Accessibility Code, 2018 Edition.
  - c. Illinois Energy Conservation Code (ICC International Energy Conservation Code, 2018 Edition, with State of Illinois modifications.
  - d. Illinois Department of Public Health (IDPH):
    - 1) Illinois Plumbing Code (Illinois Administrative Code, Title 77, Chapter I, Subchapter r, Part 890).
  - e. Illinois Environmental Protection Agency (IEPA):
    - 1) Air-Pollution Standards.
    - 2) Noise Pollution Standards.
    - 3) Water Pollution Standards.
    - 4) Public Water Supplies
    - 5) Solid Waste Standards.
    - 6) Illinois Recommended Standards for Sewage Works (Illinois Administrative Code, Title 35, Subtitle C, Chapter II, Part 370).
3. Information and Requirements for Utility Services: Local utility companies.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

**SECTION 01 42 00  
REFERENCES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Drawing symbols, abbreviations and acronyms.
- B. Definitions of terms used throughout the Contract Documents.
- C. Explanation of specification format and content.
- D. Requirements relating to referenced standards.
- E. Applicability of referenced standards.
- F. List of industry organizations and certain of their respective documents.

**1.02 DRAWING SYMBOLS AND CONVENTIONS**

- A. Abbreviations and graphic symbols are defined on the General Notes, Symbols & Abbreviations sheet of the drawings.
- B. Generally, symbols used on the mechanical and electrical drawings conform to those recommended by ASHRAE, though, where appropriate, these symbols are supplemented by more specific symbols as recommended by ASME, ASPE, or the IEEE.

**1.03 DEFINITIONS**

- A. Where the terms "indicated", "noted", "scheduled", "shown", or "specified" are used it is to help locate the reference; no limitation on location is intended except as specifically noted.
- B. Where the terms "directed", "requested", "authorized", "approved", are used as in "directed by the Architect/Engineer", no implied meaning shall be construed to extend the Architect/Engineer's responsibilities into the Contractor's purview of construction supervision.
- C. Where the term "approved" is used in conjunction with the Architect/Engineer's action on submittals, requests or applications it is limited to the duties of the Architect/Engineer as described in the Agreement, and the General and Supplemental Conditions of the Contract. Such use of the term "approval" shall not limit or release the Contractor from his responsibility to fulfill Contract requirements.
- D. Where the term "regulations" is used it means all applicable statutes, laws, ordinances, and orders issued by authorities having jurisdiction, as well as construction industry standards, rules, or conventions that address performance of the Work.
- E. The "Project Site" is the space available to the Contractor for performance of construction activities. The Project Site may be for the exclusive use of the Contractor and his activities or may be used in conjunction with others performing other construction or related activities on the Project. Unless the extent of the Project Site is indicated on the Drawings, means the limits of the area within the property line of the parcel on which the Project is located, subject to the limitations and restrictions of local ordinance and the discretion of the Owner.
- F. Where the term "furnish" is used it means supply, deliver to, and unload and store at the Project Site until the Work is ready for the item to be assembled and incorporated into the Work.

- G. Where the term "install" is used it is meant to describe operations at the Project Site to include uncrating, assembling, placing, anchoring, connecting to utilities, finishing, protecting, cleaning and all other similar operations required to fully incorporate an item into the Work.
- H. Where the term "provide" is used it means "furnish and install" as defined above.
- I. Where the term "refurbish" is used it means refinish, repair and otherwise restore to like-new condition.
- J. Where the terms "remove" or "demolish" are used they mean safely disconnect from existing utilities, permanently extract from the Work and the Project Site, and legally dispose of off-site.
- K. Where the terms "temporarily remove" or "salvage" are used they mean safely disconnect from existing utilities and carefully extract from the Work so as to prevent damage to the item and the Work.
  - 1. If the item is to be reinstalled or relocated as part of the Work, these terms also mean clean, adjust, lubricate and otherwise restore to best possible condition without repair or refinishing.
  - 2. Otherwise, these terms also mean clean item surfaces and turn over to the Owner for storage and possible future use.
- L. Where the term "reinstall" is used it means the same as "install", with respect to a temporarily removed, salvaged or relocated item.
- M. Where the term "relocate" is used it means temporarily remove and reinstall in a new location.
- N. Where the phrase "salvage in place" is used it means protect in place so as to prevent damage while adjacent elements are demolished, restore to best possible condition without repair or refinishing, and modify as necessary to properly incorporate and integrate with the Work.

#### **1.04 SPECIFICATION FORMAT AND CONTENT**

- A. These Specifications are based on the Construction Specification Institute's 49 Division format and numbering system.
- B. Language used in the Specifications and other Contract Documents is an abbreviated type. Implied words and meanings will be appropriately interpreted.
- C. Requirements expressed in imperative and streamlined language are to be performed by the Contractor. At certain locations in the text, subjective language may be used to describe responsibilities that must be fulfilled indirectly by the Contractor or others.
  - 1. Whenever a colon (:) is used within a sentence or phrase, it shall be construed to mean the words "shall be".
- D. Use of certain terms such as "carpentry" is not intended to imply that certain activities must be performed by accredited or unionized individuals of a corresponding generic name. The Specifications do, however, require that certain construction activities shall be performed by specialists who are recognized experts in the operations to be performed. Specialists shall be used for said activities, however the final responsibility for fulfilling the requirements of the Contract remains the Contractor's.

## **1.05 QUALITY ASSURANCE**

- A. For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard of date of issue specified in this section, except where a specific date is established by applicable code.
- C. Obtain copies of standards when required by the Contract Documents.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from the Architect/Engineer before proceeding.
- F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Architect/Engineer shall be altered by the Contract Documents by mention or inference otherwise in any reference document.

## **1.06 APPLICABILITY OF INDUSTRY STANDARDS**

- A. Construction industry standards shall have the same force and effect as if bound or copied directly in the Contract Documents, except where more stringent requirements are specified. All such applicable standards are made a part of the Contract Documents by reference.
  - 1. Where compliance with two or more standards are referenced and conflicting requirements for quality or quantities occur, comply with the more stringent requirements. Refer questions regarding apparently conflicting standards to the Architect/Engineer for a decision before proceeding.
  - 2. The standard of quality or quantity levels specified, shown, or referenced shall be the minimum to be provided or performed. Refer questions regarding standards of minimum quality or quantity to the Architect/Engineer before proceeding.

## **1.07 CONSTRUCTION INDUSTRY ORGANIZATIONS AND DOCUMENTS**

AA -- ALUMINUM ASSOCIATION, INC.

AAMA -- AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION

ACI -- AMERICAN CONCRETE INSTITUTE INTERNATIONAL

ANSI -- AMERICAN NATIONAL STANDARDS INSTITUTE

ASHRAE -- AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS, INC.

ASME -- THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

AWI -- ARCHITECTURAL WOODWORK INSTITUTE

AWPA -- AMERICAN WOOD-PRESERVERS' ASSOCIATION

BHMA -- BUILDERS HARDWARE MANUFACTURERS ASSOCIATION

CPSC -- CONSUMER PRODUCTS SAFETY COMMISSION

DHI -- DOOR AND HARDWARE INSTITUTE  
FM -- FACTORY MUTUAL RESEARCH CORPORATION  
ICC -- INTERNATIONAL CODE COUNCIL, INC.  
IEEE -- INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS  
ISO -- INTERNATIONAL STANDARDS ORGANIZATION  
NCMA -- NATIONAL CONCRETE MASONRY ASSOCIATION  
NEMA -- NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION  
NFPA -- NATIONAL FIRE PROTECTION ASSOCIATION  
NRCA -- NATIONAL ROOFING CONTRACTORS ASSOCIATION  
SDI -- STEEL DOOR INSTITUTE  
SDI -- STEEL DECK INSTITUTE, INC.  
SGCC -- SAFETY GLAZING CERTIFICATION COUNCIL  
SIGMA - SEALED INSULATING GLASS MANUFACTURERS ASSOCIATION (See IGMA)  
SMACNA -- SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION, INC.  
SSPC -- THE SOCIETY FOR PROTECTIVE COATINGS  
TCA -- TILE COUNCIL OF AMERICA, INC.  
UL -- UNDERWRITERS LABORATORIES INC.  
WWPA -- WESTERN WOOD PRODUCTS ASSOCIATION

#### **1.08 UNITED STATES GOVERNMENT AND RELATED AGENCIES/DOCUMENTS**

CFR -- CODE OF FEDERAL REGULATIONS  
CPSC -- CONSUMER PRODUCTS SAFETY COMMISSION  
EPA -- ENVIRONMENTAL PROTECTION AGENCY  
FS -- FEDERAL SPECIFICATIONS AND STANDARDS (General Services Administration)  
GSA -- U.S. GENERAL SERVICES ADMINISTRATION  
USGS -- UNITED STATES GEOLOGICAL SURVEY

#### **1.09 STATE GOVERNMENT AND RELATED AGENCIES/DOCUMENTS**

CDB -- ILLINOIS CAPITAL DEVELOPMENT BOARD  
IDOL -- ILLINOIS DEPARTMENT OF LABOR  
IDPH -- ILLINOIS DEPARTMENT OF PUBLIC HEALTH  
IEPA -- ILLINOIS ENVIRONMENTAL PROTECTION AGENCY



OSFM -- OFFICE OF THE ILLINOIS STATE FIRE MARSHAL

**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 telecommunications services.
- 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.

**1.02 TELECOMMUNICATIONS SERVICES**

- A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
- B. Telecommunications services shall include:
  - 1. One (1) mobile cellular telephone for each of Contractor's and any Subcontractor's field personnel.

**1.03 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.

**1.04 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 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.

**1.05 FENCING**

- A. Construction: Contractor's option.
- B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

**1.06 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:

#### **1.07 SECURITY**

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

#### **1.08 VEHICULAR ACCESS AND PARKING**

- A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
- B. Coordinate access and haul routes with governing authorities and Owner.
- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Provide means of removing mud from vehicle wheels before entering streets.
- E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

#### **1.09 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.

#### **PART 2 PRODUCTS - NOT USED**

#### **PART 3 EXECUTION - NOT USED**

**END OF SECTION**

**SECTION 01 60 00  
PRODUCT REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. General product requirements.
- B. Re-use of existing products.
- C. Transportation, handling, storage and protection.
- D. Product option requirements.
- E. Substitution limitations.
- F. Procedures for Owner-supplied products.
- 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 10 00 - Summary: Identification of Owner-supplied products.
- C. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.

**1.03 SUBMITTALS**

- A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
  - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

**PART 2 PRODUCTS**

**2.01 EXISTING PRODUCTS**

- A. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.
- B. 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.

## **2.02 NEW PRODUCTS**

- A. Provide new products unless specifically required or permitted by Contract Documents.
- B. Designed, manufactured, and tested in accordance with industry standards.

## **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 and place in location directed by Owner's representative; obtain Owner's signature on receipt for delivery prior to final payment. Submit signed receipts with Closeout Submittals.

## **PART 3 EXECUTION**

### **3.01 SUBSTITUTION LIMITATIONS**

- A. Substitutions Prior To Bid Opening: Architect/Engineer will consider a written request for substitution provided that such request is received at least seven (7) days prior to the Bid opening date. Requests received after that time will not be considered.
  - 1. Only Substitution Requests from Bidders will be considered.
  - 2. If a request is approved, the Architect/Engineer will issue an appropriate addendum not less than three (3) days prior to the Bid opening date.
- B. Document each request utilizing Substitution Request Form following this section with complete data substantiating compliance of proposed substitution with Contract Documents. Incomplete requests will not be considered. Submit a separate Substitution Request Form and accompanying documentation for each proposed substitution.
- C. Provide the following minimum documentation with each Substitution Request Form:
  - 1. Product identification, manufacturer, product data including dimensions and weight, performance and installation instructions.
  - 2. Side-by-side itemized comparison of proposed substitution with specified product.
  - 3. Coordination information including other modifications required as a result of proposed substitution.
  - 4. Cost information including the effect of the proposed substitution on the Contract Sum.
- D. Sign and date the Substitution Request Form.
- E. A request for substitution constitutes a representation that the submitter:

1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
2. Agrees to provide the same warranty for the substitution as for the specified product.
3. Agrees to coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension that may subsequently become apparent.
5. Agrees to reimburse Owner and Architect/Engineer for review or redesign services associated with re-approval by authorities having jurisdiction over the Project.

F. Architect/Engineer will notify submitter in writing of decision to accept or reject request.

G. Substitutions of products or product characteristics/components/options/accessories will not be considered when they are indicated or implied on Contractor's submittals, without separate written request, or when acceptance will require revision to the Contract Documents, whether rejection of said substitutions is expressly identified by Architect/Engineer on Contractor's submittals or not.

### **3.02 OWNER-SUPPLIED PRODUCTS**

A. See Section 01 10 00 - Summary for identification of Owner-supplied products.

### **3.03 TRANSPORTATION AND HANDLING**

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

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

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

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

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

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

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

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

### **3.04 STORAGE AND PROTECTION**

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

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

C. Store with seals and labels intact and legible.

D. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.

- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- G. Comply with manufacturer's warranty conditions, if any.
- H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- I. Prevent contact with material that may cause corrosion, discoloration, or staining.
- J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

**END OF SECTION**

## SUBSTITUTION REQUEST FORM

PROJECT: OAK BROOK PARK DISTRICT – CENTRAL PARK WEST ADA IMPROVEMENTS

SPECIFIED ITEM: \_\_\_\_\_

Specification Section	Page	Paragraph	Description
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The undersigned requests consideration of the following:

PROPOSED SUBSTITUTION: \_\_\_\_\_

Attached data includes project description, specifications, drawings, photographs, 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 which the proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing, and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.

The undersigned further states that the function, appearance, and quality of the proposed substitution are equivalent or superior to the specified item.

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Firm

\_\_\_\_\_  
Telephone

\_\_\_\_\_  
Email

Attachments (list): \_\_\_\_\_

For Use By The Architect/Engineer:

Accepted       Accepted As Noted

Not Accepted       Received Too Late

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

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

Remarks: \_\_\_\_\_



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

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Requirements for Indoor-Emissions-Restricted products.
- B. Requirements for VOC-Content-Restricted products.
- C. Requirement for installer certification that they did not use any non-compliant products.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 60 00 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.
- B. Section 07 92 00 - Joint Sealants: Emissions-compliant sealants.

**1.03 DEFINITIONS**

- A. Indoor-Emissions-Restricted Products: All products in the following product categories, whether specified or not:
- B. VOC-Content-Restricted Products: All products in the following product categories, whether specified or not:
  - 1. Interior paints and coatings applied on site.
  - 2. Interior adhesives and sealants applied on site, including flooring adhesives.
  - 3. Other products when specifically stated in the specifications.
- C. Interior of Building: Anywhere inside the exterior weather barrier.
- D. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- E. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.
- F. Inherently Non-Emitting Materials: Products composed wholly of minerals or metals, unless they include organic-based surface coatings, binders, or sealants; and specifically, the following:
  - 1. Glass.
  - 2. Ceramics.

**1.04 REFERENCE STANDARDS**

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings; 2005 (Reapproved 2018).
- C. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board; 2020.
- D. GreenSeal GS-36 - Standard for Adhesives for Commercial Use; 2013.

- E. SCAQMD 1113 - Architectural Coatings; 1977, with Amendment (2016).
- F. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2022).

## **1.05 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.
- C. Sustainable Design Reporting: Submit evidence of compliance along with Accessory Material VOC Content Certification Form following this Section.
- D. Installer Certifications Regarding Prohibited Content: Require each installer of any type of product (not just the products for which VOC restrictions are specified) to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of installer's products, or 2) that such products used comply with these requirements.

## **1.06 QUALITY ASSURANCE**

- A. VOC Content Test Method: 40 CFR 59, Subpart D (EPA Method 24), or ASTM D3960, unless otherwise indicated.
  - 1. Evidence of Compliance: Acceptable types of evidence are:
    - a. Report of laboratory testing performed in accordance with requirements.
    - b. Published product data showing compliance with requirements.
    - c. Certification by manufacturer that product complies with requirements.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. All Products: Comply with the most stringent of federal, State, and local requirements, or these specifications.
- B. VOC-Content-Restricted Products: VOC content not greater than required by the following:
  - 1. Adhesives, Including Flooring Adhesives: SCAQMD 1168 Rule.
  - 2. Aerosol Adhesives: GreenSeal GS-36.
  - 3. Joint Sealants: SCAQMD 1168 Rule.
  - 4. Paints and Coatings: Each color; most stringent of the following:
    - a. 40 CFR 59, Subpart D.
    - b. SCAQMD 1113 Rule.

## **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**

**1.01 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.

**2.01 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. Pre-installation meetings.
- C. Cutting and patching.
- D. Cleaning and protection.
- E. Demonstration and instruction of Owner personnel.
- F. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
- G. General requirements for maintenance service.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 50 00 - Temporary Facilities and Controls: Temporary exterior enclosures.
- B. Section 01 78 00 - Closeout Submittals: Project record documents, operation and maintenance data, warranties, and bonds.

**1.03 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.

**1.04 QUALIFICATIONS**

- A. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect/Engineer. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,
- B. For design of temporary shoring and bracing, employ a Professional Structural Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

## 1.05 PROJECT CONDITIONS

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- C. 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 barriers between construction areas and areas continuing to be occupied by Owner.
- D. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
- E. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
- F. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
- G. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

## 1.06 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 shown 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/Engineer 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/Engineer 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/Engineer.
- 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 CUTTING AND PATCHING**

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. 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.
- C. 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.
- D. Restore work with new products in accordance with requirements of Contract Documents.
- E. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- F. Patching:
  - 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

2. Match color, texture, and appearance.
3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

### **3.06 PROGRESS CLEANING**

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

### **3.07 PROTECTION OF INSTALLED WORK**

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

### **3.08 ADJUSTING**

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

### **3.09 FINAL CLEANING**

- A. Execute final cleaning prior to final project assessment.
  1. Clean areas to be occupied by Owner prior to final completion before Owner occupancy.
- B. Use cleaning materials that are nonhazardous.
- C. 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.
- D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.



- F. Clean filters of operating equipment.
- G. Clean debris from roofs, gutters, downspouts, and drainage systems.
- H. Clean site; sweep paved areas, rake clean landscaped surfaces.
- I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

### **3.10 CLOSEOUT PROCEDURES**

- A. See Section 01 77 00 for additional requirements.
- B. Make submittals that are required by governing or other authorities.
- C. 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.
- D. Notify Architect/Engineer when work is considered ready for Architect/Engineer's Substantial Completion inspection.
- E. 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/Engineer's Substantial Completion inspection.
- F. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect/Engineer's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect/Engineer.
- G. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
- H. Notify Architect/Engineer when work is considered finally complete and ready for Architect/Engineer's Substantial Completion final inspection.
- I. Complete items of work determined by Architect/Engineer listed in executed Certificate of Substantial Completion.

### **3.11 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 77 00  
CLOSEOUT PROCEDURES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES:**

- A. Substantial Completion Procedures.
- B. Final Completion Procedures.

**1.02 RELATED REQUIREMENTS:**

- A. Section 01 10 00 - Summary.
- B. Section 01 78 00 - Closeout Submittals.

**1.03 SUBSTANTIAL COMPLETION PROCEDURES**

- A. Pre-Substantial Completion Conference:
  - 1. Schedule a Pre-substantial Completion Conference 15 days prior to the date of Substantial Completion. Prepare an agenda with copies for the participants and preside over the meeting.
  - 2. Attendance Required: Contractor, Architect/Engineer and Owner.
  - 3. Minimum Agenda:
    - a. Schedule dates of Substantial Completion and Owner occupancy.
    - b. Schedule dates for Initial Punch Lists of respective Subcontractors to be produced.
    - c. Schedule date for written request for Substantial Completion.
    - d. Schedule target date for completion of Initial Punch List items.
    - e. Schedule delivery times for Owner-furnished items to be installed by Contractor, Owner's own forces or others under separate Contracts.
    - f. Schedule dates for Demonstration and Training of equipment and systems specified.
    - g. Schedule completion dates of testing and balancing reports for engineered Systems.
    - h. Scheduling and Sequencing of Construction operations around areas partially occupied.
    - i. Review job site security during transition of Owner occupancy.
    - j. Schedule dates for final inspections from authorities having jurisdiction for Occupancy Permits.
    - k. Review protocol for claims from potential move-in damage.
    - l. Review procedures for final cleaning.
    - m. Review potential concerns regarding environmental conditions.
  - 4. Record minutes and distribute copies within three days after meeting to participants and those affected by decisions made.
- B. Substantial Completion Procedures will be in accordance with the General Conditions of the Contract for Construction, Article 9.8 and include the following:
  - 1. When the Work or a portion of the Work is considered to be substantially complete, the Contractor inspects the project and prepares a comprehensive list of outstanding items to be completed or corrected, Initial Punch List.
  - 2. Contractor submits notice of Substantial Completion.
  - 3. Contractor completes items on the Initial Punch List.
  - 4. Architect/Engineer inspects the project to verify substantial completion and prepares a Final Punch List.

5. Architect/Engineer prepares Certificate of Substantial Completion, acceptance is required by Owner and Contractor.

#### **1.04 FINAL COMPLETION PROCEDURES**

- A. Final Completion Procedures will be in accordance with the General Conditions of the Contract for Construction, Article 9.10, and include the following:
  1. When items on Initial and Final Punch Lists are complete, submit notice of final completion and final application for payment.
  2. Submit Final Closeout Submittals as specified in Section 01 78 00.
  3. Architect will inspect project and verifies the Work is acceptable and conforms with the Contract Documents.
  4. Architect will process final application for payment and closeout submittals.

#### **1.05 CORRECTION PERIOD**

- A. Correction Period commences on the date of Substantial Completion and expires one year from that date.
- B. Owner: document non-conforming or defective work over course of Correction Period. Notify Contractor in writing of nonconforming or defective work. Copy Architect/Engineer.
  1. Life safety issues requiring immediate corrective work: Contact Contractor for action.

**PART 2 PRODUCTS - NOT USED.**

**PART 3 EXECUTION - NOT USED.**

**END OF SECTION**

**SECTION 01 78 00  
CLOSEOUT SUBMITTALS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Warranties and bonds.
- B. Project record documents.
- C. Operation and maintenance data.
- D. Format, arrangement and organization of Operation and Maintenance Manual electronic file.

**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. Submit preliminary draft of proposed formats and outlines of contents of electronic Operation and Maintenance Manual, including warranties and bonds, record document Bookmarked Adobe PDF form before start of Work. Architect/Engineer will review draft and return with comments.
- B. 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.
- C. Project Record Documents: Submit documents to Architect/Engineer with claim for final Application for Payment.
- D. 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 completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect/Engineer comments. Revise content as required prior to final submission.
- E. Submit revised final Operation and Maintenance Manual, incorporating warranties and bonds, record documents and operation and maintenance data, in final form in Adobe PDF electronic file format on USB flash drive form within 10 days after final inspection.

## **PART 2 PRODUCTS - NOT USED**

## **PART 3 EXECUTION**

### **3.01 WARRANTIES AND BONDS**

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.
- E. Include originals of each in operation and maintenance manuals, indexed separately on Table of Contents.
- F. Include color, 300 dpi resolution scans of each in Operation and Maintenance Manual PDF file, Bookmarked and indexed separately in Table of Contents.

### **3.02 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.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
  - 1. Manufacturer's name and product model and number.
  - 2. Product substitutions or alternates utilized.
  - 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
  - 1. Measured depths of foundations in relation to finish first floor datum.
  - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
  - 4. Field changes of dimension and detail.
  - 5. Details not on original Contract drawings.

### **3.03 OPERATION AND MAINTENANCE DATA**

- A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

### **3.04 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.
  - 2. Information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional information as specified in individual product specification sections.
- E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

### **3.05 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS**

- A. For Each Item of Equipment and Each System:
  - 1. Description of unit or system, and component parts.
  - 2. Identify function, normal operating characteristics, and limiting conditions.
  - 3. Include performance curves, with engineering data and tests.
  - 4. Complete nomenclature and model number of replaceable parts.
- B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- D. Include color coded wiring diagrams as installed.
- E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include

summer, winter, and any special operating instructions.

- F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- G. Provide servicing and lubrication schedule, and list of lubricants required.
- H. Include manufacturer's printed operation and maintenance instructions.
- I. Include sequence of operation by controls manufacturer.
- J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- K. Provide control diagrams by controls manufacturer as installed.
- L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Include test and balancing reports.
- O. Additional Requirements: As specified in individual product specification sections.

### **3.06 ASSEMBLY OF OPERATION AND MAINTENANCE MANUAL**

- A. Assemble operation and maintenance data into a single electronic "manual" file in Adobe PDF file format for Owner's personnel use, with data arranged in the same sequence as, and bookmarked by, the specification sections.
  - 1. Media: USB flash drive of capacity sufficient to store entire PDF file, fragmented.
  - 2. Attach a tag or label flash drive with Project name, date, and the title "O&M Manual".
- B. Organization and Arrangement of Contents: Arrange the contents of the "manual" file in using the following hierarchical system and create a corresponding hierarchy of Bookmarks in the file:
  - 1. Project Title Page.
  - 2. Project Directory.
  - 3. Table of Contents:
  - 4. Project Warranties.
    - a. Division 01 - General
      - 1) General Contractor's Warranty.
    - b. Division 02
      - 1) [One Bookmark for each Specification section number and name where a warranty is required.]
      - 2) [Continue for each applicable Specification section.]
    - c. [Continue for each applicable Division.]
  - 5. Record Documents.
    - a. Record Drawings (marked-up version of A/E Drawings).
    - b. Record Specifications (marked up version of A/E Specifications).
    - c. [Continue for each Division.]
  - 6. Operation and Maintenance Data.



- a. Division 06
  - 1) [One Bookmark for each Specification section number and name where a O&M data is required.]
  - 2) [Continue for each applicable Specification section.]
- b. [Continue for each applicable Division.]
- C. Where systems involve more than one Specification Section, provide separate Bookmark and content for each Specification Section.
- D. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
- E. Prepare data in the form of an instructional manual.
- F. Cover Page: Populate the first page of the PDF file with: printed title "OPERATION AND MAINTENANCE MANUAL"; identify title of Project; identify subject matter of contents.
- G. Project Directory: Beginning on the second page of the PDF file, provide Title and address of Project. Provide, for Architect/Engineer, Consultants, Contractor, subcontractors and major suppliers: the business name, address, telephone number(s), email address(es), contact name(s) of responsible individual(s) knowledgeable about the Project, and a brief description of the responsibility or contribution of the business to the Project.
- H. Table of Contents: List every item using the same identification as in the title of the Bookmark, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
- I. Bookmarks: Hierarchically under each Specification Section, further Bookmark each separate product and system; identify the contents in the title of the Bookmark; on the Bookmarked page provide a description of product and major component parts of equipment.
- J. Content: Manufacturer's printed data, legibly scanned, in color where applicable, at 300 dpi (minimum) resolution.
- K. Drawings: Legibly scanned, in color where applicable, at 300 dpi (minimum) resolution; PDF file page size to match native sheet size of original drawing.

### **3.07 WARRANTIES AND BONDS**

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.
- E. Include color, 300 dpi resolution scans of each in Operation and Maintenance Manual PDF file, Bookmarked and indexed separately in Table of Contents.

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

**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: See Section 31 23 23.

## **PART 3 EXECUTION**

### **3.01 DEMOLITION**

- A. Remove concrete slabs on grade as indicated on drawings.
- B. Remove other items indicated, for salvage and relocation.
- C. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as required so that required rough grade elevations do not subside within one year after completion.

### **3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS**

- A. Comply with requirements in Section 01 70 00.
- B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
  - 1. Obtain required permits.
  - 2. Comply with applicable requirements of NFPA 241.
  - 3. Use of explosives is not permitted.
  - 4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
  - 5. Provide, erect, and maintain temporary barriers and security devices.
  - 6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
  - 7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
  - 8. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
  - 9. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
- C. Do not begin removal until receipt of notification to proceed from Owner.
- D. Do not begin removal until built elements to be salvaged or relocated have been removed.
- E. Do not begin removal until vegetation to be relocated has been removed and vegetation to remain has been protected from damage.
- F. Protect existing structures and other elements to remain in place and not removed.
  - 1. Provide bracing and shoring.
  - 2. Prevent movement or settlement of adjacent structures.
  - 3. Stop work immediately if adjacent structures appear to be in danger.
- G. 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.
- 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.

### **3.03 SELECTIVE DEMOLITION FOR ALTERATIONS**

- A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.
  - 1. Verify construction and utility arrangements are as indicated.
  - 2. Report discrepancies to Architect/Engineer 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. Locate and mark piping, ducts, duct banks and conduits within and beneath slabs on grade prior to performing sawcutting and removal of slabs on grade.
- C. Separate areas in which demolition is being conducted from areas that remain occupied.
  - 1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 .
- D. Maintain weatherproof exterior building enclosure, except for interruptions required for replacement or modifications; prevent water and humidity damage.
- E. Remove existing work as indicated and required to accomplish new work.
  - 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction indicated.
  - 2. Remove items indicated on drawings.
- F. Services including, but not limited to, HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications: Remove existing systems and equipment as indicated.
  - 1. Maintain existing active systems to remain in operation, and maintain access to equipment and operational components.
  - 2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
  - 3. Verify that abandoned services serve only abandoned facilities before removal.
  - 4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.
- G. Protect existing work to remain.
  - 1. Prevent movement of structure. Provide shoring and bracing as required.
  - 2. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
  - 3. Repair adjacent construction and finishes damaged during removal work.
  - 4. Patch to match new work.

### **3.04 DEBRIS AND WASTE REMOVAL**

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.
- C. Clean up spillage and wind-blown debris from public and private lands.

**END OF SECTION**

**SECTION 03 10 00  
CONCRETE FORMING AND ACCESSORIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Formwork for cast-in-place concrete, with shoring, bracing and anchorage.
- B. Openings for other work.
- C. Form accessories.
- D. Form stripping.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 20 00 - Concrete Reinforcing.
- B. Section 03 30 00 - Cast-in-Place Concrete.

**1.03 REFERENCE STANDARDS**

- A. ACI 301 - Specifications for Concrete Construction; 2020.
- B. ACI 318 - Building Code Requirements for Structural Concrete; 2019 (Reapproved 2022).
- C. ACI 347R - Guide to Formwork for Concrete; 2014 (Reapproved 2021).
- D. PS 1 - Structural Plywood; 2023.

**1.04 DESIGN REQUIREMENTS**

- A. Design, engineer and construct formwork, shoring and bracing to conform to design and code requirements; resultant concrete to conform to required shape, line and dimension.

**1.05 QUALITY ASSURANCE**

- A. Perform work of this section in accordance with ACI 347, ACI 301, and ACI 318.

**PART 2 PRODUCTS**

**2.01 FORMWORK - GENERAL**

- A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.
- B. Design and construct concrete that complies with design with respect to shape, lines, and dimensions.
- C. Chamfer outside corners of beams, joists, columns, and walls.
- D. Comply with applicable state and local codes with respect to design, fabrication, erection, and removal of formwork.
- E. Comply with relevant portions of ACI 347R, ACI 301, and ACI 318.

**2.02 WOOD FORM MATERIALS**

- A. Form Materials: At the discretion of the Contractor.

## **2.03 REMOVABLE PREFABRICATED FORMS**

- A. Tubular Column Type: Round, spirally wound laminated fiber material, surface treated with release agent, non-reusable, of sizes indicated.

## **2.04 FORMWORK ACCESSORIES**

- A. Form Release Agent: Capable of releasing forms from hardened concrete without staining or discoloring concrete or forming bugholes and other surface defects, compatible with concrete and form materials, and not requiring removal for satisfactory bonding of coatings to be applied.
  - 1. Do not use materials containing diesel oil or petroleum-based compounds.
  - 2. Composition: Colorless, reactive, water-based compound.
- B. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

### **3.02 ERECTION - FORMWORK**

- A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301.
- B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
- C. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
- D. Align joints and make watertight. Keep form joints to a minimum.
- E. Obtain approval before framing openings in structural members that are not indicated on drawings.
- F. Provide fillet and chamfer strips on external corners of exposed corners.
- G. Coordinate this section with other sections of work that require attachment of components to formwork.
- H. If formwork is placed after reinforcement, resulting in insufficient concrete cover over reinforcement, request instructions from Architect/Engineer before proceeding.

### **3.03 APPLICATION - FORM RELEASE AGENT**

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
- C. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

### **3.04 INSERTS, EMBEDDED PARTS, AND OPENINGS**

- A. Provide formed openings where required for items to be embedded in passing through concrete work.
- B. Locate and set in place items that will be cast directly into concrete.
- C. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.
- D. Install accessories in accordance with manufacturer's instructions, so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- E. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

### **3.05 FORM CLEANING**

- A. Clean forms as erection proceeds, to remove foreign matter within forms.
- B. Clean formed cavities of debris prior to placing concrete.
  - 1. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
  - 2. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

### **3.06 FORMWORK TOLERANCES**

- A. Construct formwork to maintain tolerances required by ACI 117, unless otherwise indicated.

### **3.07 FIELD QUALITY CONTROL**

- A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and to verify that supports, fastenings, wedges, ties, and items are secure.
- B. Do not reuse wood formwork more than 2 times for concrete surfaces to be exposed to view. Do not patch formwork.

### **3.08 FORM REMOVAL**

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- C. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.

**END OF SECTION**

**SECTION 03 20 00  
CONCRETE REINFORCING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Reinforcing steel for cast-in-place concrete.
- B. Supports and accessories for steel reinforcement.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 10 00 - Concrete Forming and Accessories.
- B. Section 03 30 00 - Cast-in-Place Concrete.

**1.03 REFERENCE STANDARDS**

- A. ACI 301 - Specifications for Concrete Construction; 2020.
- B. ACI 318 - Building Code Requirements for Structural Concrete; 2019 (Reapproved 2022).
- C. ACI SP-66 - ACI Detailing Manual; 2004.
- D. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2007.
- E. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.
- F. WWR-500- Manual of Standard Practice; Structural Welded Wire Reinforcement; Wire Reinforcement Institute; latest edition.
- G. CRSI (DA4) - Manual of Standard Practice; 2018, with Errata (2019).
- H. CRSI (P1) - Placing Reinforcing Bars, 10th Edition; 2019.

**1.04 SUBMITTALS**

- A. Shop Drawings: Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.

**1.05 QUALITY ASSURANCE**

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
- B. Prepare shop drawings under the supervision of a qualified Structural Engineer (SE) experienced and licensed in design of work of this type and licensed in the State in which the Project is located.

**PART 2 PRODUCTS**

**2.01 REINFORCEMENT**

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
  - 1. Deformed billet-steel bars.
  - 2. Unfinished.
- B. Steel Welded Wire Reinforcement (WWR): 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 gauge, 0.0508 inch.
  2. Chairs, Bolsters, Bar Supports, Spacers: Factory made wire bar supports sized and shaped for adequate support of reinforcement during concrete placement.
  3. Provide stainless steel components for placement within 1-1/2 inches of weathering surfaces.

## **2.02 FABRICATION**

- A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.
- B. Welding of reinforcement is not permitted.
- C. Locate reinforcing splices not indicated on drawings at point of minimum stress.
  1. Review locations of splices with Architect/Engineer.

## **PART 3 EXECUTION**

### **3.01 PLACEMENT**

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position. Reinforcing "pull-up" during placement of concrete not acceptable.
- B. Accommodate placement of formed openings.
- C. Conform to applicable code for concrete cover over reinforcement.

### **3.02 FIELD QUALITY CONTROL**

- A. Provide free access to concrete operations at project site and cooperate with the appointed firm.

**END OF SECTION**

**SECTION 03 30 00  
CAST-IN-PLACE CONCRETE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Floors and slabs on grade.
- B. Concrete footings, foundation walls and piers.
  - 1. Concrete reinforcement.
- C. Concrete curing.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 10 00 - Concrete Forming and Accessories.
- B. Section 07 92 00 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.

**1.03 REFERENCE STANDARDS**

- A. ACI 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 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).
- E. ACI 305R - Guide to Hot Weather Concreting; 2020.
- F. ACI 306R - Guide to Cold Weather Concreting; 2016.
- G. ACI 308R - Guide to External Curing of Concrete; 2016.
- H. ACI 318 - Building Code Requirements for Structural Concrete; 2019 (Reapproved 2022).
- I. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.
- J. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.
- K. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2018.
- L. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2022a.
- M. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- N. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2020.
- O. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).

- P. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2019.
- Q. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2019, with Editorial Revision (2022).
- R. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2023, with Editorial Revision.
- S. 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).
- T. ASTM E1155M - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers (Metric); 2014.
- U. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).
- V. NSF 61 - Drinking Water System Components - Health Effects; 2022, with Errata.
- W. NSF 372 - Drinking Water System Components - Lead Content; 2022.

#### **1.04 SUBMITTALS**

- A. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
  - 1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.
- B. Mix Designs: Submit 15 days prior to start of work.
  - 1. Submit for each type of concrete specified.
  - 2. Include back-up test data.
  - 3. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.
  - 4. Indicate proposed mix design complies with requirements of ACI 318, Chapter 5 - Concrete Quality, Mixing and Placing.
- C. Test Reports: Submit report for each test or series of tests specified.

#### **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.
- B. Slabs with Moisture Vapor Reducing Admixture (MVRA): Provide warranty to cover the cost of flooring failures due to moisture migration from slabs for ten years.
  - 1. Provide warranty by manufacturer of MVRA matching terms of flooring adhesive or primer manufacturer's material defect warranty.

## **PART 2 PRODUCTS**

### **2.01 FORMWORK**

- A. Comply with requirements of Section 03 10 00.

### **2.02 REINFORCEMENT**

- A. Comply with requirements of Section 03 20 00.

### **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 C 33.
  - 1. Acquire aggregates for entire project from same source.
- C. Fly Ash: ASTM C618, Class C.
- D. Water: Clean and not detrimental to concrete.

### **2.04 ADMIXTURES**

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- B. Air Entrainment Admixture: ASTM C260/C260M.
- C. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.
- D. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
- E. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.
- F. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
- G. Accelerating Admixture: ASTM C494/C494M Type C.
- H. Retarding Admixture: ASTM C494/C494M Type B.
- I. Water Reducing Admixture: ASTM C494/C494M Type A.
- J. Moisture Vapor Reduction Admixture (MVRA): Liquid, inorganic admixture free of volatile organic compounds (VOCs) and formulated to close capillary systems formed during curing to reduce moisture vapor emission and transmission, with no adverse effect on concrete properties.
  - 1. Provide admixture in slabs to receive adhesively applied flooring or roofing.

### **2.05 ACCESSORY MATERIALS**

- A. Underslab Vapor Retarder: Sheet material complying with ASTM E1745, Class A; 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. Manufacturers:
    - a. Fortifiber Building Systems Group; Moistop Ultra 15: [www.fortifiber.com](http://www.fortifiber.com).
    - b. Stego Industries, LLC; Stego Wrap15 mils: [www.stegoindustries.com](http://www.stegoindustries.com).

- c. W. R. Meadows, Inc; PERMINATOR Class A - 15 mils: [www.wrmeadows.com](http://www.wrmeadows.com).
- B. Board Insulation: Provide at foundation perimeter and under slabs on grade. See Section 07 21 00 - Board and Batt Insulation.
- C. Anchoring Epoxy: Refer to drawings. Acceptable manufacturer's include.
  - 1. Hilti: HIT-RE500-SD injection anchoring system.
  - 2. Simpson Strong-Tie: SET-XP injection anchoring adhesive system.
  - 3. Powers Fasteners: PE 1000+ injection adhesive anchoring system.
- D. Expansion Anchors: Refer to drawings. Acceptable manufacturer's include.
  - 1. Hilti: Kwik Bolt 3 expansion anchor.
  - 2. Simpson Strong-Tie: Strong-Bolt 2 wedge anchor.

## **2.06 BONDING AND JOINTING PRODUCTS**

- A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.
- B. Epoxy Bonding System:
  - 1. Complying with ASTM C881/C881M and of Type required for specific application.
- C. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.
  - 1. Material: ASTM D1751, cellulose fiber.
- D. Slab Contraction Joint Device: Preformed linear strip intended for pressing into wet concrete to provide straight route for shrinkage cracking.
- E. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches on center; ribbed steel stakes for setting.
- F. Construction Joint Devices: Integral galvanized steel; formed to tongue and groove profile, with removable top strip exposing sealant trough, knockout holes spaced at 6 inches, ribbed steel spikes with tongue to fit top screed edge.

## **2.07 CURING MATERIALS**

- A. Curing Compound, Naturally Dissipating: Clear, water-based, liquid membrane-forming compound; complying with ASTM C309.
- B. Water: Potable, not detrimental to concrete.

## **2.08 CONCRETE MIX DESIGN**

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
  - 1. For trial mixtures method, employ independent testing agency acceptable to Architect/Engineer for preparing and reporting proposed mix designs.

- C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer. Submit to Architect for review and approval.
- D. Normal Weight Concrete: Type "A".
  - 1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 4,000 pounds per square inch.
  - 2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
  - 3. Water-Cement Ratio: Maximum 48 percent by weight.
  - 4. Total Air Content: 2 percent, determined in accordance with ASTM C 173/C 173M.
  - 5. Maximum Slump: 4 inches.
  - 6. Maximum Aggregate Size: 3/4 inch.
  - 7. MVRA Admixture.
- E. Normal Weight Concrete: Type "B".
  - 1. Compressive Strength, when tested in accordance with ASTM C 39/C 39M at 28 days: 3,000 psi.
  - 2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
  - 3. Water-Cement Ratio: Maximum 56 percent by weight.
  - 4. Total Air Content: 2 percent, determined in accordance with ASTM C 173/C 173M.
  - 5. Maximum Slump: 4 inches.
  - 6. Maximum Aggregate Size: 1 inch.
- F. Normal Weight Concrete: Type "D".
  - 1. Compressive Strength, when tested in accordance with ASTM C 39/C 39M at 28 days: 4,500 psi.
  - 2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
  - 3. Water-Cement Ratio: Maximum 44 percent by weight.
  - 4. Total Air Content: 6 percent, determined in accordance with ASTM C 173/C 173M.
  - 5. Maximum Slump: 4 inches.
  - 6. Maximum Aggregate Size: 3/4 inch.

## **2.09 MIXING**

- A. Transit Mixers: Comply with ASTM C94/C94M.
- B. 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. Verify that forms are clean and free of rust before applying release agent.

- B. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- C. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.
  - 1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
  - 2. Use latex bonding agent only for non-load-bearing applications.
- D. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and secure in place using approved epoxy.
- E. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.
  - 1. Vapor Retarder Over Granular Fill: Install compactible granular fill before placing vapor retarder as indicated on drawings. Do not use sand.

### **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. 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. Notify Architect/Engineer not less than 24 hours prior to commencement of placement operations.
- D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- E. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- F. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.
- G. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

### **3.05 SLAB JOINTING**

- A. Locate joint in center of long direction of the slab/pad.
- B. Anchor joint fillers and devices to prevent movement during concrete placement.
- C. Load Transfer Construction and Contraction Joints: Install load transfer devices as indicated; saw cut joint at surface as indicated for contraction joints.

- D. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab.
- E. Repair underslab vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.
- F. Install joint devices in accordance with manufacturer's instructions.
- G. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- H. Place concrete continuously between predetermined expansion, control, and construction joints.
- I. Do not interrupt successive placement; do not permit cold joints to occur.

### **3.06 FLOOR FLATNESS AND LEVELNESS TOLERANCES**

- A. An independent testing agency, as specified in Section 01 40 00, will inspect finished slabs for conformance to specified tolerances.
- B. Screed slabs on grade level, maintaining the following minimum F(F) Floor Flatness and F(L) Floor Levelness values when measured in accordance with ASTM E 1155/ASTM E 1155M.
  - 1. F(F): Specified Overall Value (SOV) of 35; Minimum Localized Value (MLV) of 24.
  - 2. F(L): Specified Overall Value (SOV) of 25; Minimum Localized Value (MLV) of 17.
- C. Correct the slab surface if tolerances are less than specified.
- D. Measure F(F) Floor Flatness and F(L) Floor Levelness in accordance with ASTM E1155 (ASTM E1155M), within 48 hours after slab installation; report both composite overall values and local values for each measured section.
- E. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value or less than F(F) 13/F(L) 10.
- F. 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. Repair surface defects, including tie holes, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
  - 1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
- D. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
  - 1. Provide light broom finish on exterior flat work.
  - 2. Provide 3/4" radiused edge on exposed slab edges, unless otherwise noted.



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

### **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. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
  - 2. 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.
    - a. Spraying: Spray water over floor slab areas and maintain wet.
    - b. Saturated Burlap: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place.
  - 3. Final Curing: Begin after initial curing but before surface is dry.
    - a. Moisture-Retaining Sheet: Lap strips not less than 3 inches and seal with waterproof tape or adhesive; secure at edges.

### **3.09 FIELD QUALITY CONTROL**

- A. Provide free access to concrete operations at project site and cooperate with appointed firm.

### **3.10 DEFECTIVE CONCRETE**

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- B. Repair or replacement of defective concrete will be determined by the Architect/Engineer. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect/Engineer 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

LOCATION	MIX TYPE	CONCRETE FINISH
Footings	B	Smooth Form
Foundation walls and piers	B	Smooth Form
Interior slabs on grade	A	Troweled
Exterior slabs-on-grade, stoops and aprons	D	Broom

**END OF SECTION**

**SECTION 06 10 00  
ROUGH CARPENTRY**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Structural dimension lumber framing.
- B. Exposed timber structural framing.
- C. Nonstructural dimension lumber framing.
- D. Sheathing.
- E. Subflooring.
- F. Preservative treated wood materials.
- G. Miscellaneous framing and sheathing.
- H. Communications and electrical room mounting boards.
- I. Concealed wood blocking, nailers, and supports.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 03 30 00 - Cast-in-Place Concrete: Setting anchors in concrete.
- C. Section 07 27 00 - Air Barriers: Air barrier over sheathing.
- D. Section 07 31 13 - Asphalt Shingles: Asphalt shingles over roof sheathing.
- E. Section 09 21 16 - Gypsum Board Assemblies: Gypsum-based sheathing.

**1.03 REFERENCE STANDARDS**

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- B. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
- D. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.
- E. AWPA C27 - Plywood -- Fire-Retardant Treatment by Pressure Processes; American Wood-Protection Association; 2002.
- F. AWPA U1 - Use Category System: User Specification for Treated Wood; 2023.
- G. PS 1 - Structural Plywood; 2023.

H. PS 2 - Performance Standard for Wood Structural Panels; 2018.

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

J. WWPA G-5 - Western Lumber Grading Rules; 2021.

#### **1.04 SUBMITTALS**

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

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

### **PART 2 PRODUCTS**

#### **2.01 GENERAL REQUIREMENTS**

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
1. Species: Spruce-Pine-Fir (South), unless otherwise indicated.
  2. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
  3. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at [www.alsc.org](http://www.alsc.org), and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
  4. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.
- B. Provide sustainably harvested wood; see Section 01 60 00 - Product Requirements for requirements.

#### **2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS**

- A. Grading Agency: Western Wood Products Association; WWPA G-5.
- B. Sizes: Nominal sizes as indicated on drawings, S4S.
- C. Moisture Content: S-dry or MC19.
- D. Stud Framing (2 by 2 through 2 by 6):
1. Species: Hem-Fir or Spruce-Pine-Fir.
  2. Grade: No. 2.
- E. Joist and Rafter Framing (2 by 6 through 4 by 16):
1. Species: Hem-Fir or Spruce-Pine-Fir.
  2. Grade: No. 2.
- F. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
1. Lumber: S4S, No. 2 or Standard Grade.

2. Boards: Standard or No. 3.

### **2.03 EXPOSED DIMENSION LUMBER**

- A. Sizes: Nominal sizes as indicated on drawings.
- B. Surfacing: S4S.
- C. Moisture Content: S-dry or MC19.
- D. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16 ):
  - 1. Species and Grades: As indicated on drawings for various locations.

### **2.04 TIMBERS FOR CONCEALED APPLICATIONS**

- A. Sizes: Nominal sizes as indicated on drawings, S4S.
- B. Moisture Content: S-dry (23 percent maximum).
- C. Beams and Posts 5 inches and over in thickness:
  - 1. Grade: No. 2.

### **2.05 EXPOSED TIMBERS**

- A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.
- B. Moisture Content: Kiln-dry (20 percent maximum).
- C. Surfacing: S4S.
- D. Species: Douglas Fir.
- E. Grade: No. 1.

### **2.06 CONSTRUCTION PANELS**

- A. Roof Sheathing: PS 2 type, rated Structural I Sheathing.
  - 1. Bond Classification: Exterior.
  - 2. Span Rating: 60.
  - 3. Performance Category: 3/4 PERF CAT.
- B. Wall Sheathing: PS 2 type.
  - 1. Bond Classification: Exterior.
  - 2. Grade: Structural I Sheathing.
  - 3. Span Rating: 24.
  - 4. Performance Category: 5/16 PERF CAT.
  - 5. Edge Profile: Square edge.
- C. Other Applications:
  - 1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
  - 2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
  - 3. Other Locations: PS 1, C-D Plugged or better.

## 2.07 ACCESSORIES

- A. Fasteners and Anchors:
  - 1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
- B. Sill Gasket on Top of Foundation Wall: 1/4 inch thick, plate width, closed cell plastic foam from continuous rolls.

## 2.08 FACTORY WOOD TREATMENT

- A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
  - 1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.
- B. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
  - 1. Kiln dry lumber after treatment to maximum moisture content of 15 percent.
    - a. Treat lumber exposed to weather.
  - 2. Treat lumber in contact with flashing or waterproofing.
  - 3. Treat lumber in contact with masonry or concrete.
  - 4. Treat lumber less than 18 inches above grade.
  - 5. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative.
    - a. Kiln dry plywood after treatment to maximum moisture content of 15 percent.
    - b. Treat plywood in contact with roofing, flashing, or waterproofing.
    - c. Treat plywood in contact with masonry or concrete.
    - d. Treat plywood less than 18 inches above grade.
- C. Restrictions: Do not use lumber or plywood treated with chromated copper arsenate (CCA) in exposed exterior applications subject to leaching.

## PART 3 EXECUTION

### 3.01 PREPARATION

- A. Install sill gasket under sill plate of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.
- B. Coordinate installation of rough carpentry members specified in other sections.

### 3.02 INSTALLATION - GENERAL

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
- C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

### **3.03 FRAMING INSTALLATION**

- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.
- B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.
- C. Install structural members full length without splices unless otherwise specifically detailed.
- D. 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.
- E. Install horizontal spanning members with crown edge up and not less than 1-1/2 inches of bearing at each end.
- F. 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.
- G. Provide bridging at joists in excess of 8 feet span at mid-span. Fit solid blocking at ends of members.
- H. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

### **3.04 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. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- D. Provide the following specific nonstructural framing and blocking:
  - 1. Wall brackets.
  - 2. Grab bars.
  - 3. Toilet accessories.
  - 4. Wall-mounted door stops.
  - 5. Joints of rigid wall coverings that occur between studs.

### **3.05 ROOF-RELATED CARPENTRY**

- A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.
- B. Provide wood curb at each roof opening except where prefabricated curbs are specified and where specifically indicated otherwise; form corners by alternating lapping side members.

### **3.06 INSTALLATION OF CONSTRUCTION PANELS**

- A. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
  - 1. At long edges use sheathing clips where joints occur between roof framing members.
  - 2. Nail panels to framing; staples are not permitted.
- B. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.
  - 1. Use plywood or other acceptable structural panels at building corners, for not less than 96 inches, measured horizontally.

### **3.07 TOLERANCES**

- A. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.
- B. Variation from Plane, Other than Floors: 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

### **3.08 CLEANING**

- A. Waste Disposal:
  - 1. Comply with applicable regulations.
  - 2. Do not burn scrap on project site.
  - 3. Do not burn scraps that have been pressure treated.
  - 4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.
- B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.
- C. Prevent sawdust and wood shavings from entering the storm drainage system.

### **3.09 SCHEDULE**

- A. Upper Level Floor and Ceiling Joists, Rafters: Spruce-Pine-Fir, No. 2 Grade.
- B. Exposed Beams: Spruce-Pine-Fir, No. 2 Grade.
- C. Blocking in Walls: Untreated.

**END OF SECTION**



**SECTION 06 20 00  
FINISH CARPENTRY**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Wood casings and moldings.
- B. Hardware and attachment accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 10 00 - Rough Carpentry: Support framing, grounds, and concealed blocking.

**1.03 REFERENCE STANDARDS**

- A. ANSI A135.4 - Basic Hardboard; 2012 (Reaffirmed 2020).
- B. ANSI A208.1 - American National Standard for Particleboard; 2022.
- C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- E. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2020.
- F. NHLA G-101 - Rules for the Measurement and Inspection of Hardwood and Cypress; 2023.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
  - 1. Scale of Drawings: 1-1/2 inch to 1 foot, minimum.
  - 2. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
- C. Samples: Submit two samples of finish plywood, 12 x 12 inch in size illustrating wood grain and specified finish.
- D. Samples: Submit two samples of wood trim 12 inch long.

**1.05 QUALITY ASSURANCE**

- A. Perform work in accordance with AWI Architectural Woodwork Quality Standards Illustrated, Premium grade.
- B. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of experience.
  - 1. Company with at least one project within the past 5 years with value of woodwork within 20 percent of cost of woodwork for this project.
  - 2. Single Source Responsibility: Provide and install this work from single fabricator.

## **PART 2 PRODUCTS**

### **2.01 FINISH CARPENTRY ITEMS**

- A. Quality Standard: Premium Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- B. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by applicable code.

### **2.02 LUMBER MATERIALS**

- A. Hardwood Lumber: cedar species, plain sawn, maximum moisture content of 8 percent, of quality suitable for transparent finish.

### **2.03 SHEET MATERIALS**

- A. Hardwood Plywood: Face species red oak, plain sawn, book matched, medium density fiberboard core; HPVA HP-1, Front Face Grade AA, Back Face Grade 1, glue type as recommended for application.
- B. Particleboard: ANSI A208.1; Composed of wood chips, sawdust, or flakes of medium density, made with waterproof resin binders; of grade to suit application; sanded faces.
- C. Hardboard: ANSI A135.4; Pressed wood fiber with resin binder, Class 1 - Tempered, 1/4 inch thick, smooth one side (S1S).

### **2.04 FASTENINGS**

- A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.
- B. Fasteners: Of size and type to suit application; any finish in concealed locations and wood finish in exposed locations.
- C. Concealed Joint Fasteners: Threaded steel.

### **2.05 ACCESSORIES**

- A. Lumber for Shimming and Blocking: Softwood lumber of pine or poplar species.
- B. Primer: Alkyd primer sealer.
- C. Wood Filler: Solvent base, tinted to match surface finish color.

### **2.06 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 EXAMINATION**

- A. Verify adequacy of backing and support framing.

- B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.
- C. See Section 06 10 00 for installation of recessed wood blocking.

### **3.02 INSTALLATION**

- A. Install custom fabrications in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.
- B. Set and secure materials and components in place, plumb and level.
- C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

### **3.03 PREPARATION FOR SITE FINISHING**

- A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.
- B. Site Finishing: See Section 09 91 13.
- C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

**END OF SECTION**

**SECTION 07 21 00  
THERMAL INSULATION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Board insulation and integral vapor retarder at perimeter foundation wall and underside of floor slabs.
- B. Batt insulation and vapor retarder in exterior wall and roof construction.
- C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 10 00 - Rough Carpentry: Installation requirements for board insulation over steep slope roof sheathing or roof structure.
- B. Section 07 26 00 - Vapor Retarders: Separate vapor retarder materials.
- C. Section 07 27 00 - Air Barriers: Separate air barrier materials.

**1.03 REFERENCE STANDARDS**

- A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.
- B. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2023.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.
- E. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.
- F. ABAA Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of contractor accreditation and installer certification on project site during and after installation. Present on-site documentation upon request.

**1.05 FIELD CONDITIONS**

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

## **PART 2 PRODUCTS**

### **2.01 APPLICATIONS**

- A. Insulation Under Concrete Slabs: Extruded polystyrene (XPS) board.
- B. Insulation at Perimeter of Foundation: Extruded polystyrene (XPS) board.
- C. Insulation in Wood Framed Walls: Batt insulation with integral vapor retarder.

### **2.02 FOAM BOARD INSULATION MATERIALS**

- A. Extruded Polystyrene (XPS) Board Insulation At Perimeter of Foundation and Under Concrete Slabs: Complies with ASTM C578 with either natural skin or cut cell surfaces.
  - 1. Type and Compressive Resistance (by Location):
    - a. Vertically, At Perimeter of Foundation: Type IV, 25 psi (173 kPa), minimum.
    - b. Horizontally, Under Concrete Slabs: Type VII, 60 psi (414 kPa), minimum.
  - 2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
  - 3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
  - 4. Thermal Resistance, R-value: Type IV and Type VII, 5.0 (0.88) per 1 inch thickness at 75 degrees F mean temperature.
  - 5. Board Thickness: 2 inches, unless indicated otherwise on drawings.
  - 6. Board Edges: Square.
  - 7. Type and Water Absorption: Type IV and Type VII, 0.3 percent by volume, maximum, by total immersion.
  - 8. Products:
    - a. DuPont de Nemours, Inc: [building.dupont.com](http://building.dupont.com).
    - b. Owens Corning Corporation: [www.ocbuildingspec.com](http://www.ocbuildingspec.com).
    - c. Substitutions: See Section 01 60 00 - Product Requirements.

### **2.03 MINERAL FIBER BLANKET INSULATION MATERIALS**

- A. Flexible Glass Fiber Blanket Thermal Insulation: Preformed insulation, complying with ASTM C665; friction fit.
  - 1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
  - 2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
  - 3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
  - 4. Formaldehyde Content: Zero.
  - 5. Thermal Resistance: R-value as indicated on the Drawings.
  - 6. Thickness: Sized to fill cavity, unless specific thickness is annotated on the Drawings.
  - 7. Facing: Aluminum foil, flame spread 25 rated; one side.
  - 8. Products:
    - a. CertainTeed Corporation: [www.certainteed.com](http://www.certainteed.com).
    - b. Johns Manville: [www.jm.com](http://www.jm.com).
    - c. Owens Corning Corporation: [www.ocbuildingspec.com](http://www.ocbuildingspec.com).
- B. Mineral Wool Blanket Thermal Insulation: Flexible or semi-rigid preformed insulation, complying with ASTM C665.
  - 1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.

2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
3. Provide foil facing on one side, at locations indicated on drawings.
4. Thermal Resistance: R-value as indicated on the Drawings.
5. Thickness: Sized to fill cavity, unless a specific thickness is annotated on the Drawings.
6. Products:
  - a. Johns Manville: [www.jm.com](http://www.jm.com).
  - b. ROCKWOOL (ROXUL, Inc): [www.rockwool.com](http://www.rockwool.com).
  - c. Thermafiber, Inc; SAFB: [www.thermafiber.com](http://www.thermafiber.com).

## **2.04 ACCESSORIES**

- A. Insulation Fasteners: Impaling clip of unfinished steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.
- B. Nails or Staples: Steel wire; electroplated or galvanized; type and size to suit application.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
- B. Verify substrate surfaces are flat, free of irregularities.

### **3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER**

- A. Install boards horizontally on foundation perimeter.
  1. Butt edges and ends tightly to adjacent boards and to protrusions.
- B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

### **3.03 BOARD INSTALLATION UNDER CONCRETE SLABS**

- A. Place insulation under slabs on grade after base for slab has been compacted.
- B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
- C. Prevent insulation from being displaced or damaged while placing vapor retarder and placing slab.

### **3.04 BATT INSTALLATION**

- A. Install insulation and vapor retarder in accordance with manufacturer's instructions.
- B. Install in exterior wall spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
- E. Install with factory-applied vapor retarder membrane facing warm side of building spaces. Lap ends and side flanges of membrane over framing members.
- F. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.

- G. At wood framing, place vapor retarder on warm side of insulation by stapling at 6 inches on center. Lap and seal sheet retarder joints over face of member.
- H. Tape seal tears or cuts in vapor retarder.
- I. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane; tape seal in place.
- J. Coordinate work of this section with construction of air barrier seal, see Section 07 27 00.

### **3.05 PROTECTION**

- A. Do not permit installed insulation to be damaged prior to its concealment.

**END OF SECTION**

**SECTION 07 27 00  
AIR BARRIERS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Air barriers.

**1.02 DEFINITIONS**

- A. Air Barrier: Airtight barrier made of material that is virtually air impermeable but water vapor permeable, both to amount as specified, with sealed seams and sealed joints to adjacent surfaces.

**1.03 REFERENCE STANDARDS**

- A. AATCC Test Method 127 - Test Method for Water Resistance: Hydrostatic Pressure; 2018, with Editorial Revision (2019).
- B. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.
- C. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-- Tension; 2016 (Reapproved 2021).
- D. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds; 1998 (Reapproved 2017).
- E. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2021.
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
- G. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2022a, with Editorial Revision (2023).
- H. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
- I. ICC-ES AC148 - Acceptance Criteria for Flexible Flashing Materials; 2017, with Editorial Revision (2021).
- J. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2023.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on material characteristics, performance criteria, and limitations.
- C. Shop Drawings: Provide drawings of special joint conditions.
- D. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.



## **1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

## **1.06 FIELD CONDITIONS**

- A. Maintain temperature and humidity recommended by materials manufacturers before, during, and after installation.

## **PART 2 PRODUCTS**

### **2.01 AIR BARRIER MATERIALS (AIR IMPERMEABLE AND WATER VAPOR PERMEABLE)**

- A. Air Barrier Sheet, Mechanically Fastened:
  - 1. Air Permeance: 0.004 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
  - 2. Water Vapor Permeance: 10 perms, minimum, when tested in accordance with ASTM E96/E96M using Procedure A - Desiccant Method, at 73.4 degrees F.
  - 3. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 90 days of weather exposure.
  - 4. Surface Burning Characteristics: Flame spread index of 25 or less, and smoke developed index of 50 or less, Class A, when tested in accordance with ASTM E84.
  - 5. Seam and Perimeter Tape: Polyethylene self-adhering type, mesh reinforced, 2-1/2 inches wide, compatible with sheet material; unless otherwise indicated.
  - 6. Products:
    - a. Carlisle Coatings and Waterproofing, Inc; CCW 705 RS: [www.carlisleccw.com/#sle](http://www.carlisleccw.com/#sle).
    - b. DuPont de Nemours, Inc; Tyvek Construction Wrap with FlexWrap, StraightFlash, VersaFlange, Tyvek Wrap Caps, and Tyvek Tape: [building.dupont.com/#sle](http://building.dupont.com/#sle).
    - c. Henry Company; WeatherSmart Commercial: [www.henry.com/#sle](http://www.henry.com/#sle).
    - d. VaproShield, LLC; WrapShield IT - Integrated Tape: [www.vaproshield.com/#sle](http://www.vaproshield.com/#sle).
    - e. Substitutions: See Section 01 60 00 - Product Requirements.

### **2.02 ACCESSORIES**

- A. Sealants, Tapes, and Accessories for Sealing Air Barrier and Adjacent Substrates: As indicated or in compliance with air barrier manufacturer's installation instructions.
- B. Flexible Flashing: Self-adhering or mechanically-attached flashing used for wall penetrations in accordance with ICC-ES AC148 requirements.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that surfaces and conditions are ready for work of this section.
- B. Where existing conditions are responsibility of another installer, notify Architect/Engineer of unsatisfactory conditions.
- C. Do not proceed with this work until unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
- B. Clean and prime substrate surfaces to receive adhesives and sealants in accordance with manufacturer's installation instructions.

### **3.03 INSTALLATION**

- A. Install materials in accordance with manufacturer's installation instructions.
- B. Air Barriers: Install continuous airtight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
- C. Apply sealants and adhesives within recommended temperature range in accordance with manufacturer's installation instructions.
- D. Mechanically Fastened Sheets - On Exterior:
  - 1. Install sheets shingle fashion to shed water, with seams generally horizontal.
  - 2. Overlap seams as recommended by manufacturer, 6 inches, minimum.
  - 3. Overlap at outside and inside corners as recommended by manufacturer, 12 inches, minimum.
  - 4. Attach to framed construction with fasteners extending through sheathing into framing, and space fasteners at 12 to 18 inches on center along each framing member supporting sheathing.
  - 5. For applications indicated to be airtight, seal seams, laps, penetrations, tears, and cuts with self-adhesive tape; use only large-headed, gasketed fasteners as recommended by manufacturer.
  - 6. Install air barrier underneath jamb flashings.
  - 7. At framed openings with frames having nailing flanges, extend sheet into opening and over flanges; at head of opening, seal sheet over flange and flashing.
- E. Openings and Penetrations in Exterior Air Barriers:
  - 1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches onto air barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
  - 2. At openings with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 4 inches wide; do not seal sill flange.
  - 3. At openings with nonflanged frames, seal air barrier to each side of framing at opening using flashing at least 9 inches wide, and covering entire depth of framing.
  - 4. At head of openings, install flashing under air barrier extending at least 2 inches beyond face of jambs; seal air barrier to flashing.
  - 5. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
  - 6. Service and Other Penetrations: Form flashing around penetrating item and seal to air barrier surface.

### **3.04 PROTECTION**

- A. Do not leave materials exposed to weather longer than recommended by manufacturer.

**END OF SECTION**

**SECTION 07 31 13  
ASPHALT SHINGLES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Asphalt shingle roofing.
- B. Flexible sheet membranes for eave protection, underlayment, and valley protection.
- C. Metal flashing.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 10 00 - Rough Carpentry: Roof sheathing.
- B. Section 07 71 23 - Manufactured Gutters and Downspouts.

**1.03 REFERENCE STANDARDS**

- A. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2017 (Reapproved 2023).
- B. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2021.
- C. ASTM D3161/D3161M - Standard Test Method for Wind Resistance of Steep Slope Roofing Products (Fan-Induced Method); 2020.
- D. ASTM D3462/D3462M - Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules; 2023.
- E. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2018).
- F. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings; 2020a.
- G. ASTM F1667/F1667M - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples; 2021a.
- H. NRCA (RM) - The NRCA Roofing Manual; 2023.
- I. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.
- J. UL (DIR) - Online Certifications Directory; Current Edition.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data indicating material characteristics, performance criteria, and limitations.
- C. Shop Drawings: For metal flashings, indicate specially configured metal flashings, fastening methods and locations, and installation details.

- D. Samples: Submit two samples of each shingle color indicating color range and finish texture/pattern ; for color selection.
- E. Manufacturer's Installation Instructions: Indicate installation criteria and procedures.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- G. Installer's qualification statement.
- H. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- I. 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 Shingles: One bundle of selected type and color.

### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacture of roofing systems similar to those required for this project, with not less than 30 years of experience.
- B. Installer Qualifications: Company specializing in installing asphalt shingles, with at least ten years of documented experience.

### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver and store materials with labels intact in manufacturer's unopened packaging until ready for installation.
- B. Store materials under dry and waterproof cover, well ventilated, and elevated above grade on a flat surface.
- C. Protect materials from harmful environmental elements, construction dust, direct sunlight, and other potentially detrimental conditions.
- D. When storing roofing materials on roofing system ensure that no damage occurs to supporting members and other materials.

### **1.07 FIELD CONDITIONS**

- A. Do not install shingles, eave protection membrane or underlayment when surface, ambient air, or wind chill temperatures are below 45 degrees F.

### **1.08 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Provide forty (40) year (min.) manufacturer's warranty for coverage against manufacturing defects.
- C. Provide fifteen (15) year manufacturer's standard warranty for wind damage.
- D. Extended Correction Period: Correct defective work within 2-year period commencing on Date of Substantial Completion.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

#### **A. Asphalt Shingles:**

1. Certaineed Roofing; Landmark Premium Shingles: [www.certainteed.com](http://www.certainteed.com).
2. GAF; Timberline High Definition: [www.gaf.com](http://www.gaf.com).
3. IKO Industries Inc; Cambridge: [www.iko.com](http://www.iko.com).
4. Owens Corning Corp; Oakridge: [www.owenscorning.com](http://www.owenscorning.com).
5. Tamko Roofing Products; Heritage Premium: [www.tamko.com](http://www.tamko.com).
6. Substitutions: Not permitted.

### **2.02 ASPHALT SHINGLES**

#### **A. Asphalt Shingles: Asphalt-coated glass felt, mineral granule surfaced, complying with ASTM D3462/D3462M.**

1. Fire Resistance: Class A, complying with ASTM E108.
2. Wind Resistance: Class A, when tested in accordance with ASTM D3161/D3161M.
3. Warranted Wind Speed: Not greater than 60 mph.
4. Algae resistant.
5. Self-sealing type.
6. Style: Laminated overlay.
7. Color: Match existing shingle color..

### **2.03 SHEET MATERIALS**

#### **A. Manufacturers/Products: Same as manufacturer of asphalt shingles, or approved by shingle manufacturer, for incorporation into shingle manufacturer's total roofing system warranty.**

#### **B. Eave Protection Membrane:**

#### **C. Eave Edge Starter Shingles: Glass felt base, with ceramic coated mineral granules tightly embedded in refined, water-resistant asphalt, complying with ASTM D3462/D3462M.**

1. Wind Resistance: Class F, when tested in accordance with ASTM D3161/D3161M.
2. Fire Resistance: Class A, complying with ASTM E108.
3. Shingle Size: 7-5/8 by 38-3/4 inches, nominal.
4. Application: Roof with slope greater than 2 inches per foot and shingle exposure less than 5-5/8 inches.

#### **D. Underlayment: Asphalt-saturated organic roofing felt, unperforated, complying with ASTM D226/D226M, Type I, No. 15.**

#### **E. Flexible Flashing: Self-adhering polymer-modified asphalt sheet complying with ASTM D1970/D1970M; 40 mil total thickness; with strippable treated release paper and polyethylene sheet top surface.**

### **2.04 METAL FLASHING**

#### **A. Metal Flashings: Provide sheet metal eave edge.**

1. Form sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.

2. Hem exposed edges of flashings minimum 1/4 inch on underside.
- B. Aluminum Flashing: Prefinished aluminum, 26 gauge, 0.017 inch minimum thickness; PVC coating, color as selected.

## **2.05 ACCESSORIES**

- A. Roofing Nails: Standard round wire shingle type, galvanized steel, stainless steel, or aluminum roofing nails, minimum 3/8-inch head diameter, 12-gauge, 0.109-inch nail shank diameter, 1-1/2 inches long and complying with ASTM F1667/F1667M.
- B. Asphalt Roof Cement: ASTM D4586/D4586M, asbestos-free.
- C. Lap Cement: Fibrated cutback asphalt type, recommended for use in application of underlayment, free of toxic solvents.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions prior to starting this work.
- B. Verify that roof deck is of sufficient thickness to accept fasteners.
- C. Verify that roof penetrations and plumbing stacks are in place and flashed to deck surface.
- D. Verify roof openings are correctly framed.
- E. Verify deck surfaces are dry, free of ridges, warps, or voids.

### **3.02 PREPARATION**

- A. Seal roof deck joints wider than 1/16 inch as recommended by shingle manufacturer.
- B. At areas where eave protection membrane is to be adhered to substrate, fill knot holes and surface cracks with latex filler.
- C. Broom clean deck surfaces before installing underlayment or eave protection.
- D. Protect surrounding areas and adjacent surfaces from damage during execution of this work.
- E. Install eave edge flashings tight with fascia boards, weather lap joints 2 inches and seal with plastic cement, and secure flange with nails spaced 6 inches on center.

### **3.03 INSTALLATION**

- A. Eave Protection Membrane:
  1. Install eave protection membrane from eave edge to minimum 24 inches up-slope beyond interior face of exterior wall.
  2. Install eave protection membrane in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
- B. Underlayment:
  1. Roof Slopes Up to 4:12: Install two layers of underlayment over area not protected by eave protection, with ends and edges weather lapped minimum 4 inches; stagger end laps of each consecutive layer and nail in place.

2. Roof Slopes Greater Than 4:12: Install underlayment perpendicular to slope of roof, with ends and edges weather lapped minimum 4 inches; stagger end laps of each consecutive layer, nail in place, and weather lap minimum 4 inches over eave protection.
  3. Weather lap and seal watertight with plastic cement any items projecting through or mounted on roof.
- C. Valley Protection:
1. Install flexible flashing in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
  2. Weather lap joints minimum 2 inches.
  3. Nail in place minimum 18 inches on center, 1 inch from edges.
- D. Metal Flashing:
1. Install flashings in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
  2. Weather lap joints minimum 2 inches and seal weather tight with plastic cement.
  3. Secure in place with nails at 12 inches on center, and conceal fastenings.
  4. Items Projecting Through or Mounted on Roofing: Flash and seal weather tight with plastic cement.
- E. Shingles:
1. Install shingles in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
    - a. Fasten individual shingles using two nails per shingle, or as required by manufacturer and local building code, whichever is greater.
    - b. Fasten strip shingles using four nails per strip, or as required by manufacturer and local building code, whichever is greater.
  2. Place shingles in straight coursing pattern with 5-inch weather exposure to produce double thickness over full roof area, and provide double course of shingles at eaves.
  3. Project first course of shingles 3/4 inch beyond fascia boards.
  4. Extend shingles 1/2 inch beyond face of gable edge fascia boards.
  5. Extend shingles on one slope across valley and fasten; trim shingles from other slope 2 inches from valley center line to achieve closed cut valley, concealing valley protection.
  6. Cap hips with individual shingles, maintaining 5-inch weather exposure, and place to avoid exposed nails.
  7. Coordinate installation of roof mounted components or work projecting through roof with weathertight placement of counterflashings.
  8. Complete installation to provide weathertight service.

### **3.04 CLEANING**

- A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.
- B. Clean exposed work upon completion of installation; remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to finish.

### **3.05 PROTECTION**

- A. Do not permit traffic over finished roof surface; protect roofing until completion of project.

B. Touch-up, repair, or replace damaged asphalt shingles or accessories before Date of Substantial Completion.

**END OF SECTION**



**SECTION 07 46 23  
WOOD SIDING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Wood siding with boards for walls.

**1.02 RELATED REQUIREMENTS**

- A. Section 09 91 13 - Exterior Painting: Prime and finish painting.

**1.03 REFERENCE STANDARDS**

- A. APA PRP-108 - Performance Standards and Qualification Policy for Wood Structural Panels (Form E445); 2021.
- B. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
- D. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17; 2018.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturer's data on materials, fastening methods, jointing details, sizes, finishes, and accessories; showing compliance with requirements, including:
  - 1. Physical characteristics of components shown on shop drawings.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation instructions and recommendations.
- C. Manufacturer's qualification statement.
- D. Installer's qualification statement.

**1.05 QUALITY ASSURANCE**

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

**1.06 FIELD CONDITIONS**

- A. Do not install siding when air temperature or relative humidity are outside manufacturer's limits.

**1.07 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Extended Correction Period: Correct defective work within 2-year period commencing on Date of Substantial Completion.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Wood Siding:
  - 1. Centennial Woods LLC: [www.centennialwoods.com/#sle](http://www.centennialwoods.com/#sle).
  - 2. Nova USA Wood Products: [www.novausawood.com/#sle](http://www.novausawood.com/#sle).

### **2.02 PERFORMANCE REQUIREMENTS**

- A. Comply with local wind load resistance requirements of ASCE 7.
- B. Plywood Sheathing: Comply with APA PRP-108 grade or type standards and labeled by APA certified grading agency.

### **2.03 WOOD SIDING MATERIALS**

- A. Grade lumber in accordance with the following:
  - 1. Western Red Cedar: WCLIB (GR).
- B. Board Siding: Flat, western red cedar, maximum moisture content of 10 percent.
  - 1. As indicated on drawings.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that substrates are ready to receive work.
- B. Do not begin until unacceptable conditions have been corrected.
- C. If substrate preparation is the responsibility of another installer, notify Architect/Engineer of unsatisfactory preparation before proceeding.

### **3.02 PREPARATION**

- A. Protect surrounding areas and adjacent surfaces during execution of this work.

### **3.03 INSTALLATION**

- A. Install siding, soffits, batten strips, and trim in accordance with manufacturer's instructions.
- B. Fasten siding securely in place, level and plumb.
  - 1. Arrange for orderly nailing pattern, blind nail except over trim.
  - 2. Install siding for natural shed of water.
  - 3. Position cut ends over bearing surfaces, and sand cut edges smooth and clean.
- C. Install board siding using single course method with 1 inch by 1 inch exposure.
  - 1. Nail at 12 inches on center.
  - 2. Miter horizontal joints tight at 45 degrees, miter external and miter internal corners.
- D. Seal exposed wood substrates exposed to weather to prevent water accumulation and moisture intrusion.
  - 1. Seal penetrations.
  - 2. Seal exposed cuts of siding and trim; use of field-applied coatings is not permitted.

E. Sand work smooth and set exposed nails and screws.

### **3.04 CLEANING**

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.

B. Clean exposed work upon completion of installation; remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to finish.

### **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 07 71 23  
MANUFACTURED GUTTERS AND DOWNSPOUTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Pre-finished aluminum gutters and downspouts.
- B. Precast concrete splash pads.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 31 13 - Asphalt Shingles: Roofing system.

**1.03 REFERENCE STANDARDS**

- A. ASTM A48/A48M - Standard Specification for Gray Iron Castings; 2022.
- B. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- C. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Comply with SMACNA (ASMM) for sizing components for rainfall intensity determined by a storm occurrence of 1 in 5 years.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on prefabricated components.
- C. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details.
- D. Samples: Submit two samples, 12 inch long illustrating component design, finish, color, and configuration.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Stack material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope to drain.
- B. Prevent contact with materials that could cause discoloration, staining, or damage.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Gutters and Downspouts:
  - 1. ATAS International, Inc: [www.atas.com](http://www.atas.com).
  - 2. Cheney Flashing Company: [www.cheneyflashing.com](http://www.cheneyflashing.com).
  - 3. Drexel Metals Inc: [www.drexmet.com](http://www.drexmet.com).

## 2.02 MATERIALS

- A. Pre-Finished Aluminum Sheet: ASTM B209/B209M; 0.032 inch thick.
  - 1. Finish: Plain, shop pre-coated with PVDF (polyvinylidene fluoride) coating.
  - 2. Color: To match existing.

## 2.03 COMPONENTS

- A. Gutters: SMACNA Style K (ogee) profile.
- B. Gutter Wedge: Match existing shape.
- C. Downspouts: SMACNA corrugated rectangular profile.
- D. Anchors and Supports: Profiled to suit gutters and downspouts.
  - 1. Anchoring Devices: In accordance with SMACNA requirements.
  - 2. Gutter Supports: Straps.
  - 3. Downspout Supports: Brackets.
- E. Fasteners: Galvanized steel, with soft neoprene washers.

## 2.04 ACCESSORIES

- A. Downspout Boots: Smooth interior without boxed corners or choke points; include integral lug slots and on-body cleanout and cover with neoprene gaskets.
  - 1. Configuration: Angular.
  - 2. Material: Cast iron; ASTM A48/A48M; casting thickness 3/8 inch (9.5 mm), minimum.
  - 3. Finish: Manufacturer's standard factory applied powder coat finish.
  - 4. Color: To be selected by Architect/Engineer from manufacturer's standard range.
  - 5. Accessories: Manufacturer's standard stainless steel fasteners, stainless steel building wall anchors, and rubber coupling.
  - 6. Products:
    - a. Downspoutboots.com, a division of J. R. Hoe & Sons: [www.downspoutboots.com](http://www.downspoutboots.com).

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that surfaces are ready to receive work.

### 3.02 PREPARATION

- A. Paint concealed sheet metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to a minimum dry film thickness of 15 mil, 0.015 inch.

### 3.03 INSTALLATION

- A. Install gutters, downspouts, and accessories in accordance with manufacturer's instructions.
- B. Sheet Metal: Join lengths with formed seams sealed watertight. Flash and seal gutters to downspouts and accessories.
- C. Slope gutters 1/16 inch per foot, maximum.

- D. Connect downspouts to downspout boots at 6 inches above grade. Seal connection watertight.
- E. Connect boots where indicated to PVC piping for underground installation. PVC opens to grade downslope.

**END OF SECTION**

## **SECTION 07 92 00 JOINT SEALANTS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Nonsag gunnable joint sealants.
- B. Self-leveling pourable joint sealants.
- C. Joint backings and accessories.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Additional requirements for sealants and primers.
- B. Section 09 21 16 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.
- C. Section 09 30 00 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

#### **1.03 REFERENCE STANDARDS**

- A. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).
- B. ASTM C834 - Standard Specification for Latex Sealants; 2017 (Reapproved 2023).
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
- D. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2023.
- E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).
- F. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints; 2019 (Reapproved 2020).
- G. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2022).
- H. SWRI (VAL) - SWR Institute Validated Products Directory; Current Edition.

#### **1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:
  - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
  - 2. List of backing materials approved for use with the specific product.
  - 3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
  - 4. Substrates the product should not be used on.
  - 5. Substrates for which use of primer is required.

6. Substrates for which laboratory adhesion and/or compatibility testing is required.
  7. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
  8. Sample product warranty.
  9. Certification by manufacturer indicating that product complies with specification requirements.
  10. SWRI Validation: Provide currently available sealant product validations as listed by SWRI (VAL) for specified sealants.
- C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
- D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
- E. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect/Engineer and submit at least two physical samples for verification of color of each required sealant.
- F. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.
- G. Executed warranty.

## **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.
- C. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
1. Adhesion Testing: In accordance with ASTM C794.
  2. Compatibility Testing: In accordance with ASTM C1087.
  3. Allow sufficient time for testing to avoid delaying the work.
  4. Deliver sufficient samples to manufacturer for testing.
  5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.

## **1.06 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 2-year manufacturer warranty for installed sealants and accessories that fail to achieve a watertight seal, exhibit loss of adhesion or cohesion, or do not cure. Complete forms in Owner's name and register with manufacturer.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Nonsag Sealants:
1. Dow Corning Corporation: [www.dowcorning.com/construction](http://www.dowcorning.com/construction).
  2. Hilti, Inc: [www.us.hilti.com](http://www.us.hilti.com).



3. Master Builders Solutions by BASF: [www.master-builders-solutions.basf.us/en-us](http://www.master-builders-solutions.basf.us/en-us).
4. Momentive Performance Materials, Inc (formerly GE Silicones): [www.momentive.com](http://www.momentive.com).
5. Pecora Corporation: [www.pecora.com](http://www.pecora.com).
6. Sika Corporation: [www.usa-sika.com](http://www.usa-sika.com).
7. Tremco Commercial Sealants & Waterproofing: [www.tremcosealants.com](http://www.tremcosealants.com).
8. W.R. Meadows, Inc: [www.wrmeadows.com](http://www.wrmeadows.com).

## 2.02 JOINT SEALANT APPLICATIONS

### A. Scope:

1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to:
  - a. Joints between door, window, and other frames and adjacent construction.
  - b. Joints between different exposed materials.
  - c. Other joints indicated below.
2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
  - a. Joints between door, window, and other frames and adjacent construction.
  - b. Joints between plumbing fixtures and adjacent construction.
  - c. Other joints indicated below.

### B. Exterior Joints: Use non-sag silyl-terminated polyether/polyurethane sealant, unless otherwise indicated.

1. Lap Joints in Sheet Metal Fabrications: Butyl rubber, non-curing.
2. Control and Expansion Joints in Concrete Paving: Self-leveling polyurethane "traffic-grade" sealant.

### C. Interior Joints: Use non-sag acrylic-urethane sealant, unless otherwise indicated.

1. Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant.
2. Wall and Ceiling Joints in Wet Areas: Non-sag polyurethane sealant for continuous liquid immersion.
3. Floor Joints in Wet Areas: Non-sag polyurethane "non-traffic-grade" sealant suitable for continuous liquid immersion.
4. Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; clear.
5. Narrow Control Joints in Interior Concrete Slabs: Self-leveling polyurethane sealant.

## 2.03 JOINT SEALANTS - GENERAL

- ### A. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.

## 2.04 NONSAG JOINT SEALANTS

- ### A. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.

1. Color: Clear.
2. Products:
  - a. Pecora Corporation; Pecora 898 NST (Non-Staining Technology): [www.pecora.com/#sle](http://www.pecora.com/#sle).
  - b. Sika Corporation; Sikasil GP: [www.usa-sika.com](http://www.usa-sika.com).

- c. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
  - 1. Hardness Range: 35 to 45, Shore A, when tested in accordance with ASTM C661.
  - 2. Products:
    - a. Sika Corporation; Sikaflex-15 LM: [www.usa-sika.com](http://www.usa-sika.com).
    - b. Sika Corporation; Sikaflex-2c NS: [www.usa-sika.com](http://www.usa-sika.com).
    - c. Tremco Commercial Sealants & Waterproofing; Dymonic 100: [www.tremcosealants.com](http://www.tremcosealants.com).
    - d. Substitutions: See Section 01 60 00 - Product Requirements.

## **2.05 ACCESSORIES**

- A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
  - 1. Open Cell: 40 to 50 percent larger in diameter than joint width.
  - 2. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.
- B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.
- C. Masking Tape: Self-adhesive, nonabsorbent, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
- D. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.
- E. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

### **3.02 PREPARATION**

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

### **3.03 INSTALLATION**

- A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

- B. Provide joint sealant installations complying with ASTM C1193.
- C. Install bond breaker backing tape where backer rod cannot be used.
- D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- E. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained, and instructions are followed.
- F. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

**END OF SECTION**

**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.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Hollow Metal Doors and Frames:
  - 1. Ceco Door, an Assa Abloy Group company: [www.assaabloydss.com](http://www.assaabloydss.com).
  - 2. Curries, an Assa Abloy Group company: [www.assaabloydss.com](http://www.assaabloydss.com).
  - 3. Republic Doors, an Allegion brand: [www.republicdoor.com](http://www.republicdoor.com).
  - 4. Steelcraft, an Allegion brand: [www.allegion.com](http://www.allegion.com).

**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. Door Edge Profile: Manufacturers standard for application indicated.
  - 4. 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.
  - 5. 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. Exterior Doors: Thermally insulated.
  - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    - a. Level 3 - Extra Heavy-duty.

- b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
- c. Model 2 - Seamless.
- d. Door Face Metal Thickness: 16 gauge, 0.053 inch, minimum.
- 2. Door Core Material: Polyurethane, 1.8 lbs/cu ft minimum density.
  - a. Foam Plastic Insulation: Manufacturer's standard board insulation with maximum flame spread index (FSI) of 75, and maximum smoke developed index (SDI) of 450 in accordance with ASTM E84, and completely enclosed within interior of door.
- 3. Door Thermal Resistance: U-factor of 0.77, maximum.
- 4. Door Thickness: 1-3/4 inches, nominal.
- 5. Top and Bottom Closures: Flush with top/bottom of faces and edges.
- 6. Door Face Sheets: Flush.
- 7. Weatherstripping: Refer to Section 08 71 00.
- 8. Door Finish: Factory primed and field finished.

## **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. 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 A60/ZF180 coating.
  - 2. Frame Metal Thickness: 16 gauge, 0.053 inch, minimum.
  - 3. Frame Finish: Factory primed and field finished.
  - 4. Weatherstripping: Separate, see Section 08 71 00.
- C. Interior Door Frames, Non-Fire Rated: Face welded type; non-welded joints filled for seamless appearance.
  - 1. Frame Metal Thickness: 16 gauge, 0.053 inch, minimum.
  - 2. Frame Finish: Factory primed and field finished.

## **2.05 FINISHES**

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

## **2.06 ACCESSORIES**

- A. 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.
- B. 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 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. Coordinate frame anchor placement with wall construction.
- C. 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.
- D. Coordinate installation of electrical connections to electrical hardware items.
- E. Touch up damaged factory finishes.

### **3.03 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.

### **3.04 ADJUSTING**

- A. Adjust for smooth and balanced door movement.

### **3.05 SCHEDULE**

- A. Refer to Door and Frame 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 configuration; non-rated.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 11 13 - Hollow Metal Doors and Frames.
- B. Section 08 71 00 - Door Hardware.

**1.03 REFERENCE STANDARDS**

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
- D. Samples: Submit two samples of door veneer, 9 by 12 inches in size illustrating wood grain, stain color, and sheen.
- E. Manufacturer's Installation Instructions: Indicate special installation instructions.
- F. Warranty, executed in Owner's name.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than ten years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than five 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, and inspect for damage.
- C. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

## **1.07 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide manufacturer's warranty on interior doors for the life of the installation. Complete forms in Owner's name and register with manufacturer.
  - 1. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Wood Veneer Faced Doors:
  - 1. Graham Wood Doors: [www.grahamdoors.com](http://www.grahamdoors.com).
  - 2. Marshfield DoorSystems, Inc: [www.marshfielddoors.com](http://www.marshfielddoors.com).
  - 3. Oshkosh Door Company: [www.oshkoshdoor.com](http://www.oshkoshdoor.com).
  - 4. VT Industries, Inc: [www.vtindustries.com](http://www.vtindustries.com).
  - 5. Substitutions: See Section 01 60 00 - Product Requirements.

### **2.02 DOORS**

- A. Doors: See drawings for locations and additional requirements.
  - 1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
  - 2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
- B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
  - 1. Provide solid core doors at each location.
  - 2. Wood veneer facing with factory transparent finish.

### **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.

### **2.04 DOOR FACINGS**

- A. Veneer Facing for Transparent Finish: White birch, 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.

### **2.05 DOOR CONSTRUCTION**

- A. Fabricate doors in accordance with door quality standard specified.
- B. Cores Constructed with stiles and rails:
- C. Provide solid blocks at lock edge for hardware reinforcement.
  - 1. Provide solid blocking for other throughbolted hardware.
- D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.



- E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
- F. Provide edge clearances in accordance with the quality standard specified.

## **2.06 FINISHES - WOOD VENEER DOORS**

- A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
  - 1. Transparent:
    - a. System - 2, Lacquer, Precatalyzed.
    - b. Stain: As selected by Architect/Engineer.
    - c. Sheen: Satin.

## **2.07 ACCESSORIES**

- A. Hollow Metal Door Frames: See Section 08 11 13.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

### **3.02 INSTALLATION**

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
- B. 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.

### **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.

### **3.05 SCHEDULE**

- A. See Door and Frame Schedule on the Drawings.

**END OF SECTION**

**SECTION 08 43 13**  
**ALUMINUM-FRAMED STOREFRONTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Aluminum-framed storefront, with vision glass.
- B. Aluminum doors and frames.
- C. Weatherstripping.
- D. Certain door hardware components.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 71 00 - Door Hardware: Hardware items other than specified in this section.
- B. Section 08 71 13 - Power Door Operators: Power door operators and actuators.
- C. Section 08 80 00 - Glazing: Glass and glazing accessories.

**1.03 REFERENCE STANDARDS**

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.
- B. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; 2015.
- C. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2020.
- D. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- E. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- G. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- H. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).
- I. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2023.
- J. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2023.
- K. NFRC 400 - Procedures for Determining Fenestration Product Air Leakage; 2014.

**1.04 SUBMITTALS**

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

- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
- D. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.
- E. Non-Residential Fenestration Calculation Report: For each exterior storefront system (framing and glass combined) and door (including glass) indicating U-factors and SHGC values have been calculated in accordance with NFRC 100 and NFRC 200.
- F. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- G. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- H. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
- I. NFRC Label Certificate: For each exterior storefront system (framing and glass combined) and door (including glass) indicating U-factors have been determined in accordance with NFRC 100 and comply with specified U-factor performance requirements. Make available at Project Site for inspection by Authority Having Jurisdiction (AHJ). Submit memorandum copy of certificate(s) and proof of acceptance by AHJ to Architect/Engineer.

#### **1.05 QUALITY ASSURANCE**

- A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.
- B. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least ten years of experience.
- C. Installer Qualifications: Company specializing in performing work of type specified and with at least five years of documented experience.
  - 1. Provide company, field supervisors, and installers that hold active ANSI accredited certifications in appropriate categories for work specified.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

#### **1.07 FIELD CONDITIONS**

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

#### **A. Aluminum-Framed Storefronts:**

1. C.R. Laurence Company, Inc; U.S. Aluminum; IT451 (Thermal) - Center Glazed with 550 Series wide stile doors: [www.crl-arch.com](http://www.crl-arch.com).
2. EFCO Corporation; Series 403 Thermal: [www.efcocorp.com](http://www.efcocorp.com).
3. Kawneer North America; 451T with wide stile doors: [www.kawneer.com](http://www.kawneer.com).
4. Oldcastle BuildingEnvelope; Series 3000 Thermal MultiPlane: [www.oldcastlebe.com](http://www.oldcastlebe.com).
5. Pittco Architectural Metals Inc; TMS 114T: [www.pittcometals.com](http://www.pittcometals.com).
6. Tubelite, Inc; T14000 Series (Thermal-polyurethane casting) with wide stile doors: [www.tubeliteinc.com](http://www.tubeliteinc.com).
7. YKK AP America; YES 45 TU with Model 50D wide stile doors: [www.ykkap.com](http://www.ykkap.com).

### **2.02 ALUMINUM-FRAMED STOREFRONT**

#### **A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.**

1. Glazing Rabbet: For 1 inch insulating glazing and for 1/4 monolithic glazing, as indicated on Drawings.
2. Glazing Position: Centered (front to back).
3. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.
4. Finish: Class I color anodized.
  - a. Factory finish all surfaces that will be exposed in completed assemblies.
5. Finish Color: Dark bronze, to match existing.
6. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
7. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
8. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
9. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
10. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
11. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
12. Maintain continuous air barrier and/or vapor retarder seal throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel, and heel bead of glazing compound.

#### **B. Performance Requirements**

1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5

- times the design wind loads and 10 second duration of maximum load.
- a. Design Wind Loads: Comply with requirements of ASCE 7.
  - b. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
2. Air Leakage Laboratory Test: Maximum of 0.06 cu ft/min sq ft of wall area (1.00 cu ft/min sq ft for entrance doors), when tested in accordance with NFRC 400 or ASTM E283 at 1.57 psf pressure differential across assembly.
  3. Overall System U-factor, Including Glazing: 0.38 Btu/(hr sq ft deg F), maximum, for NFRC standard specimen size, when tested in accordance with NFRC 100.
  4. U-factor/U-value of Entrance Doors: 0.77 Btu/(hr sq ft deg F), maximum, when tested in accordance with NFRC 100.
  5. Solar Heat Gain Coefficient (SHGC) of Glass: Refer to Section 08 80 00.

## 2.03 COMPONENTS

- A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
  1. Framing members for interior applications need not be thermally broken.
  2. Glazing Stops: Flush.
- B. Glazing: See Section 08 80 00.
- C. Swing Doors: Glazed aluminum.
  1. Thickness: 1-3/4 inches.
  2. Finish: Same as storefront.

## 2.04 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Sheet Aluminum: ASTM B209/B209M.
- C. Fasteners: Stainless steel.
- D. Exposed Flashings: Aluminum sheet, 20 gauge, 0.032 inch minimum thickness unless noted otherwise; finish to match framing members.
- E. Concealed Flashings: Sheet aluminum, 26 gauge, 0.017 inch minimum thickness.
- F. Sill Flashing Sealant: Elastomeric, silicone or polyurethane, compatible with flashing material.
- G. Sealant for Setting Thresholds: Non-curing butyl type.
- H. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- I. Glazing Accessories: See Section 08 80 00.

## 2.05 FINISHES

- A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils thick.

-OR-

- B. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils thick.
- C. Touch-Up Materials: As recommended by coating manufacturer for field application.

## **2.06 HARDWARE**

- A. For each door, include weatherstripping, sill sweep strip, and threshold.
- B. Other Door Hardware: See Section 08 71 00.
- C. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
- D. Sill Sweep Strips: Resilient seal type, of neoprene; provide on all exterior doors.
- E. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all exterior doors.
- F. Power Door Operators and Actuators: See Section 08 71 13.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that storefront wall openings and adjoining water-resistive and/or air barrier seal materials are ready to receive work of this section.

### **3.02 INSTALLATION**

- A. Install wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
- H. Coordinate attachment and seal of perimeter air and vapor barrier materials.
- I. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- J. Set thresholds in bed of sealant and secure.
- K. Install other hardware using templates provided.
  - 1. See Section 08 71 00 for hardware installation requirements.

- 2. See Section 08 71 13 for operator and actuator installation requirements.
- L. Install glass using glazing method required to achieve performance criteria; see Section 08 80 00.
- M. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

### **3.03 TOLERANCES**

- A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

### **3.04 FIELD QUALITY CONTROL**

- A. Water-Spray Test: Provide water spray quality test of installed storefront components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
  - 1. Perform a minimum of two tests in each designated area as directed by Architect.
  - 2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.

### **3.05 ADJUSTING**

- A. Adjust operating hardware for smooth operation.

### **3.06 CLEANING**

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, and take care to remove dirt from corners and to wipe surfaces clean.
- C. Remove excess sealant by method acceptable to sealant and framing manufacturers.

### **3.07 PROTECTION**

- A. Protect installed products from damage until Date of Substantial Completion.

**END OF SECTION**

**SECTION 08 52 00  
CLAD WOOD WINDOWS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Factory-fabricated wood windows.
- B. Glazing.
- C. Wood trim for exterior finishing.

**1.02 RELATED REQUIREMENTS**

- A. Section : 07 27 00 - Air Barriers: Sealing frames to water-resistive barrier installed on adjacent construction.
- B. Section 07 92 00 - Joint Sealants: Sealing joints between frames and adjacent construction.
- C. Section 09 91 23 - Interior Painting: Site finishing wood surfaces.

**1.03 REFERENCE STANDARDS**

- A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights; 2022.
- B. ASTM E2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights; 2023.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Show component dimensions, anchorage and fasteners, glass, and internal drainage details.
- C. Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work, and installation requirements.
- D. Manufacturer's Certificate: Certify that products furnished meet or exceed specified requirements.
- E. Grade Substantiation: Prior to submitting shop drawings or starting fabrication, submit one of the following showing compliance with specified grade:
  - 1. Evidence of AAMA Certification; label or other documentation.
  - 2. Evidence of WDMA Certification.
  - 3. Evidence of CSA Certification.
  - 4. Test report(s) by independent testing agency itemizing compliance and acceptable to authorities having jurisdiction.
- F. Test Reports: Prior to submitting shop drawings or starting fabrication, submit test report(s) by independent testing agency showing compliance with performance requirements in excess of those prescribed by specified grade.
- G. Installer's qualification statement.



## **1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of experience.

## **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Protect factory finished surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond when exposed to sunlight or weather.

## **1.07 FIELD CONDITIONS**

## **1.08 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 5-year manufacturer warranty for insulated glass units against seal failure, interpane dusting or misting, and replacement of same. Complete forms in Owner's name and register with manufacturer.
- C. Manufacturer Warranty: Provide 2-year manufacturer warranty against defects listed. Complete forms in Owner's name and register with manufacturer or warrantor.
  - 1. Degradation of color finish.
  - 2. Delamination or separation of finish cladding from window member.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Aluminum Clad Wood Windows:
  - 1. Pella Corporation; Pella Reserve Traditional: [www.pellacommercial.com](http://www.pellacommercial.com).
  - 2. Substitutions: Not permitted.

### **2.02 WOOD WINDOWS**

- A. Wood Windows: Wood frame and sash, factory fabricated and assembled.
  - 1. Exterior Finish: Metal clad, painted.
  - 2. Interior Finish: Unfinished, for opaque finish.
  - 3. Color: As selected by Architect/Engineer from manufacturer's full range, to match existing.
  - 4. Configuration: As indicated on drawings.
  - 5. Window Product Types: FW - Fixed window, in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.
  - 6. Factory glazed; wet-dry glazing method.
  - 7. Wood Species: Clear pine, preservative treated using treatment type suitable for required finish.
  - 8. Frame and Sash Members: Mortise and tenon joints. Glue and steel pin joints to hairline fit, weather tight.
  - 9. Metal Cladding: Formed aluminum, factory finished, factory fit to profile of wood members.

## **2.03 COMPONENTS**

- A. Glazing: Double glazed, clear, Low-E coated, argon filled, with glass thicknesses as recommended by manufacturer for specified wind conditions.
- B. Frames: 13/16 inch wide by 5 inch deep profile; formed metal glass stops to match cladding, sloped for positive drainage.
- C. Sills: Brake-formed aluminum, with 3/4 inch nominal thickness; sloped for positive drainage; fits under sash and projects at least 1/2 inch beyond exterior face of wall; single piece full width of opening.
- D. Fasteners: Stainless steel.
- E. Sealant and Backing Materials: See Section 07 92 00 of types as indicated.
  - 1. Perimeter Sealant: Appropriate for application.
- F. Flashing: Provide related flashings, with necessary anchors and attachment devices.
- G. Sealant for Setting Sill Flashing: Non-curing butyl type.

## **2.04 PERFORMANCE REQUIREMENTS**

- A. Comply with AAMA/WDMA/CSA 101/I.S.2/A440 requirements for the specific window type in accordance with the following:
  - 1. Performance Class (PC): AW.
  - 2. Performance Grade (PG): 50, with minimum design pressure (DP) of 50.13 psf.
- B. Overall Thermal Transmittance (U-value): 0.38, maximum, including glazing, measured on window sizes required for this project.

## **2.05 ALUMINUM FINISHES**

- A. Manufacturer's proprietary standard finish.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify wall openings and adjoining water-resistive barrier materials are ready to receive wood windows; see Section 07 27 00.

### **3.02 INSTALLATION**

- A. Install windows in accordance with manufacturer's instructions.
- B. Install windows in accordance with ASTM E2112.
- C. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.
- D. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.
- E. Finish interior surfaces with opaque materials; see Section 09 91 23.

### **3.03 TOLERANCES**

- A. Maximum Variation from Level or Plumb: 1/16 inch per 3 ft non-cumulative or 1/8 inch per 10 ft, whichever is less.

### **3.04 CLEANING**

- A. Remove protective material from factory finished surfaces.
- B. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.
- C. Remove excess glazing sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

**END OF SECTION**

**SECTION 08 71 00  
DOOR HARDWARE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Hardware for wood, aluminum, and hollow metal doors.
- B. Electrically operated and controlled hardware.
  - 1. Communications/control wiring and final communications/control wiring connections to electrically operated and controlled hardware components will be by Owner's Security Consultant.
- C. Thresholds.
- D. Weatherstripping and gasketing.
- E. Specialty trim components.
- F. Keying of locks.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 11 13 - Hollow Metal Doors and Frames.
- B. Section 08 14 16 - Flush Wood Doors.
- C. Section 08 43 13 - Aluminum-Framed Storefronts: Door hardware, except as noted in section.
- D. Section 08 71 13 - Power Door Operators.

**1.03 REFERENCE STANDARDS**

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. BHMA (CPD) - Certified Products Directory; Current Edition.
- C. BHMA A156.1 - Standard for Butts and Hinges; 2021.
- D. BHMA A156.3 - Exit Devices; 2020.
- E. BHMA A156.4 - Door Controls - Closers; 2019.
- F. BHMA A156.6 - Standard for Architectural Door Trim; 2021.
- G. BHMA A156.7 - Template Hinge Dimensions; 2016.
- H. BHMA A156.13 - Mortise Locks & Latches Series 1000; 2022.
- I. BHMA A156.16 - Auxiliary Hardware; 2023.
- J. BHMA A156.21 - Thresholds; 2019.
- K. BHMA A156.22 - Standard for Gasketing; 2021.
- L. BHMA A156.31 - Electric Strikes and Frame Mounted Actuators; 2019.
- M. BHMA A156.36 - Auxiliary Locks; 2020.

- N. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.
- O. BHMA A156.115W - Hardware Preparation in Wood Doors with Wood or Steel Frames; 2006.
- P. DHI (H&S) - Sequence and Format for the Hardware Schedule; 2019.
- Q. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- R. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- S. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.
- T. UL (DIR) - Online Certifications Directory; Current Edition.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.
- B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
- C. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; attendance is required by affected installers and the following:
  - 1. Architect/Engineer.
  - 2. Installer's Architectural Hardware Consultant (AHC).
  - 3. Hardware Installer.
  - 4. Owner's Security Consultant.
- D. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
- E. Keying Requirements Meeting:
  - 1. Schedule meeting at project site prior to Contractor occupancy.
  - 2. Attendance Required:
    - a. Contractor.
    - b. Owner.
    - c. Installer's Architectural Hardware Consultant (AHC).
    - d. Owner's Security Consultant.
  - 3. Agenda:
    - a. Establish keying requirements.
    - b. Verify locksets and locking hardware are functionally correct for project requirements.
    - c. Verify that keying and programming complies with project requirements.
    - d. Establish keying submittal schedule and update requirements.
  - 4. Incorporate "Keying Requirements Meeting" decisions into keying submittal upon review of door hardware keying system including, but not limited to, the following:
    - a. Access control requirements.
    - b. Key control system requirements.
    - c. Schematic diagram of preliminary key system.
  - 5. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect/Engineer, Owner, participants, and those affected by decisions made.

6. Deliver established keying requirements to manufacturers.

## 1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.
- C. Shop Drawings - Door Hardware Schedule: Submit detailed listing that includes each item of hardware to be installed on each door. Use door numbering scheme as included in Contract Documents.
  - 1. Prepared by or under supervision of Architectural Hardware Consultant (AHC).
  - 2. Comply with DHI (H&S) using door numbers and hardware set numbers as indicated in construction documents.
  - 3. List groups and suffixes in proper sequence.
  - 4. Provide complete description for each door listed.
  - 5. Provide manufacturer name, product names, and catalog numbers; include functions, types, styles, sizes and finishes of each item.
  - 6. Include account of abbreviations and symbols used in schedule.
- D. Shop Drawings - Electrified Door Hardware: Submit diagrams for power, signal, and control wiring for electrified door hardware that include details of interface with building safety and security systems. Provide elevations and diagrams for each electrified door opening as follows:
  - 1. Prepared by or under supervision of Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC).
  - 2. Elevations: Submit front and back elevations of each door opening showing electrified devices with connections installed and an operations narrative describing how opening operates from either side at any given time.
  - 3. Diagrams: Submit point-to-point wiring diagram that shows each device in door opening system with related colored wire connections to each device.
- E. Keying Schedule:
  - 1. Submit three (3) copies of Keying Schedule in compliance with requirements established during Keying Requirements Meeting unless otherwise indicated.
- F. Installer's qualification statement.
- G. Supplier's qualification statement.
- H. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.
- I. Maintenance Materials and Tools: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
  - 2. Lock Cylinders: One for each master keyed group.
  - 3. Tools: One set of each special wrench or tool applicable for each different or special hardware component, whether supplied by hardware component manufacturer or not.

## **1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years of experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified for commercial door hardware with at least five years of documented experience.
- C. Supplier Qualifications: Company with certified Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC) to assist in work of this section.

## **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

## **1.08 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Provide manufacturers' warranties against defects in material and workmanship for period indicated, from Date of Substantial Completion.
  - 1. Closers: Twenty-five years, minimum.
  - 2. Exit Devices: Three years, minimum.
  - 3. Locksets and Cylinders: Three years, minimum.

## **PART 2 PRODUCTS**

### **2.01 DESIGN AND PERFORMANCE CRITERIA**

- A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.
- B. Provide individual items of single type, of same model, and by same manufacturer.
- C. Provide door hardware products that comply with the following requirements:
  - 1. Applicable provisions of federal, state, and local codes.
  - 2. Accessibility: ADA Standards and ICC A117.1.
  - 3. Listed and certified compliant with specified standards by BHMA (CPD).
  - 4. Auxiliary Hardware: BHMA A156.16.
  - 5. Hardware Preparation for Steel Doors and Steel Frames: BHMA A156.115.
  - 6. Hardware Preparation for Wood Doors with Wood or Steel Frames: BHMA A156.115W.
  - 7. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified.
- D. Electrically Operated and/or Controlled Hardware: Provide necessary power supplies, power transfer hinges, relays, and interfaces as required for proper operation; provide wiring between hardware and control components and to building power connection in compliance with NFPA 70.
- E. Lock Function: Provide lock and latch function numbers and descriptions of manufacturer's series. See Door Hardware Schedule.
- F. Fasteners:

1. Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.
  - a. Aluminum fasteners are not permitted.
  - b. Provide phillips flat-head screws with heads finished to match door surface hardware unless otherwise indicated.
2. Provide machine screws for attachment to reinforced hollow metal and aluminum frames.
  - a. Self-drilling (Tek) type screws are not permitted.
3. Provide stainless steel machine screws and lead expansion shields for concrete and masonry substrates.
4. Provide wall grip inserts for hollow wall construction.
5. Provide spacers or sex bolts with sleeves for through bolting of hollow metal doors and frames.
6. Fire-Rated Applications: Comply with NFPA 80.
  - a. Provide wood or machine screws for hinges mortised to doors or frames, strike plates to frames, and closers to doors and frames.
  - b. Provide steel through bolts for attachment of surface mounted closers, hinges, or exit devices to door panels unless proper door blocking is provided.

## 2.02 HINGES

- A. Hinges: Comply with BHMA A156.1, Grade 1 for heavy weight hinges, Grade 2 for standard weight hinges.
  1. Provide hinges on every side-swinging door.
- B. Butt Hinges: Comply with BHMA A156.1 and BHMA A156.7 for templated hinges.
  1. Manufacturers:
    - a. Bommer Industries, Inc: [www.bommer.com](http://www.bommer.com).
    - b. Hager Companies: [www.hagerco.com](http://www.hagerco.com).
    - c. Ives, a Lockmart company: [www.iveshinges.com](http://www.iveshinges.com).
    - d. McKinney; an Assa Abloy Group company: [www.assaabloydss.com](http://www.assaabloydss.com).
    - e. Stanley, a Lockmart company: [www.stanleyhinges.com](http://www.stanleyhinges.com).
    - f. Substitutions: Not permitted.
  2. Imported or so-called "economical" or "contractor grade" hinges are not acceptable.
  3. Size: Sufficient to clear trim and allow doors, otherwise free of obstruction, to open 180 degrees.
    - a. Door Leaves Up To 36 inches Wide and 1¾ inches Thick: 4½ x 4 ½ inch.
    - b. Door Leaves over 36 inches Wide And/Or Over 1¾ inches Thick: 5 x 5 inches.
  4. Material:
    - a. Interior Door Leafs Up To 36 Inches Wide: Wrought or stainless steel, standard weight (0.134 inch).
    - b. Vestibule Doors, Exterior Doors, and Door Leafs Over 36 Inches Wide: Solid bronze or stainless steel, heavy weight (0.180 or 0.190 inch).
  5. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
  6. Provide ball-bearing hinges at each door with closer.
  7. Provide non-removable pins on exterior outswinging doors.
  8. Provide power transfer hinges or electric power transfers where electrified hardware is mounted in door leaf. Provide four- or eight-wire type as appropriate for complete installation of:
    - a. Concealed door monitoring contacts and other security access components.
    - b. Power transfer to/from other scheduled door hardware.



9. Provide following quantity of butt hinges for each door:
  - a. Doors From 60 inches High up to 90 inches High: Three hinges.

## **2.03 EXIT DEVICES**

- A. Manufacturer: Match existing.
- B. Exit Devices: Comply with BHMA A156.3, Grade 1.
  1. Lever design to match lockset trim.
  2. Provide cylinder with cylinder dogging or locking trim, except for devices on fire rated doors and on openings with electric strikes.
  3. Provide exit devices properly sized for door width and height.
  4. Provide strike as recommended by manufacturer for application indicated, except where electric strikes are scheduled.
  5. Provide UL (DIR) listed exit device assemblies for fire-rated doors and panic device assemblies for non-fire-rated doors.

## **2.04 ELECTRIC STRIKES**

- A. Manufacturers:
  1. Adams Rite, HES, or Securitron; an Assa Abloy Group company: [www.assaabloydss.com](http://www.assaabloydss.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Electric Strikes: Comply with BHMA A156.31, Grade 1.
  1. Provide UL (DIR) listed burglary-resistant electric strike; style to suit locks.
  2. Provide non-handed 24 VDC electric strike suitable for door frame material and scheduled lock configuration.
  3. Provide field selectable Fail Safe/Fail Secure modes.
  4. Provide transformer and rectifier as necessary for complete installation.
  5. Connect electric strikes into fire alarm where non-rated doors are scheduled to release with fire or sprinkler alarm condition.

## **2.05 LOCK CYLINDERS**

- A. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.
  1. Type: Provide cylinders to fit locksets and exit devices and to fit cores matching Owner's existing core type.
  2. Provide cams and/or tailpieces as required for locking devices.

## **2.06 MORTISE LOCKS**

- A. Manufacturer: match existing.
- B. Mortise Locks: Comply with BHMA A156.13, Grade 1, Security, 1000 Series.
  1. Latchbolt Throw: 3/4 inch, minimum.
  2. Deadbolt Throw: 1 inch, minimum.
  3. Backset: 2-3/4 inch unless otherwise indicated.
  4. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
    - a. Finish: To match lock or latch.

## **2.07 AUXILIARY LOCKS (DEADLOCKS)**

- A. Manufacturers: Match that of existing locksets.
- B. Auxiliary Locks (Deadlocks): Comply with BHMA A156.36, Grade 1.
  - 1. Type: Small Format Mortise.
  - 2. Application: Mortised.
  - 3. Backset: 2-3/4 inch, unless otherwise indicated.
  - 4. Bolt Throw: 1/2 inch, with latch made of hardened steel.

## **2.08**

## **2.09 DOOR PULLS AND PUSH PLATES**

- A. Manufacturers:
  - 1. Rockwood; an Assa Abloy Group company: [www.assaabloydss.com](http://www.assaabloydss.com).
  - 2. Hiawatha, Inc, division of Activar Construction Products Group, Inc:  
[www.activarcpg.com/hiawatha](http://www.activarcpg.com/hiawatha).
  - 3. Trimco: [www.trimcohardware.com](http://www.trimcohardware.com).
  - 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Door Pulls and Push Plates: Comply with BHMA A156.6.
  - 1. Pull Type: Straight, unless otherwise indicated on Drawings.
  - 2. Push Plate Type: Flat, with square corners, unless otherwise indicated.
    - a. Edges: Beveled, unless otherwise indicated.
  - 3. Material: Stainless steel, unless otherwise indicated.
  - 4. Provide door pulls and push plates on doors without a lockset, latchset, exit device, or auxiliary lock unless otherwise indicated.
  - 5. On solid doors, provide matching door pull and push plate on opposite faces.
  - 6. On glazed storefront doors, provide push bar width of door with pull handle unless otherwise indicated on Drawings.

## **2.10 CLOSERS**

- A. Manufacturers; Surface Mounted: Match existing.
- B. Closers: Comply with BHMA A156.4, Grade 1.
  - 1. Type: Surface mounted to door.
  - 2. Provide door closer on each exterior door.
  - 3. At corridor entry doors, mount closer on room side of door.
  - 4. At outswinging exterior doors, mount closer on interior side of door.

## **2.11 POWER DOOR OPERATORS**

- A. See Section 08 71 13.

## **2.12 PROTECTION PLATES**

- A. Manufacturers:
  - 1. Rockwood; an Assa Abloy Group company: [www.assaabloydss.com](http://www.assaabloydss.com).
  - 2. Hager Companies: [www.hagerco.com](http://www.hagerco.com).

3. Hiawatha, Inc, an Activar Construction Products Group company:  
www.activarcpg.com/hiawatha.
  4. Ives, an Allegion brand: www.allegion.com/us.
  5. Trimco: www.trimcohardware.com.
  6. Substitutions: Not permitted.
- B. Protection Plates: Comply with BHMA A156.6.
- C. Metal Properties: Stainless steel material.
1. Metal, Standard Duty: Thickness 0.050 inch, minimum.
- D. Edges: Beveled, on four sides unless otherwise indicated.
- E. Fasteners: Countersunk screw fasteners.
- F. Drip Guard: Provide at head of exterior doors unless covered by roof or canopy.
- G. Kick Plates
1. Provide along bottom edge of push side of every door with closer, except aluminum storefront and glass entry doors, unless otherwise indicated.
    - a. Size: 8 inch high by 2 inch less door width (LDW) on push side of door.
- H. MOP PLATES
1. Provide along bottom edge of push side of doors to provide protection from cleaning liquids and equipment damage to door surface.
    - a. Size: 6 inch high by 1 inch less door width (LDW) on pull side and 2 inch LDW on push side of door.
- I. Manufacturers:
1. Rockwood; an Assa Abloy Group company: www.assaabloydss.com.
  2. Hager Companies; #232W: www.hagerco.com.
  3. Ives, an Allegion brand; #WS401/402: www.allegion.com/us.
  4. Trimco; #1270: www.trimcohardware.com.
  5. Substitutions: Not permitted.
- J. Wall Stops: Comply with BHMA A156.16, Grade 1 and Resilient Material Retention Test as described in this standard.
1. Provide wall stops to prevent damage to wall surface upon opening door.
  2. Type: Bumper; concave for cylindrical locks; convex for mortise locks, exit devices and door pulls.
  3. Material: Aluminum housing with rubber insert.

## 2.13 THRESHOLDS

- A. Thresholds: Comply with BHMA A156.21.
1. Provide threshold at each exterior door, unless otherwise indicated.
  2. Type: Saddle.
  3. Material: Aluminum.
  4. Threshold Surface: Fluted horizontal grooves across full width.
  5. Field cut threshold to profile of frame and width of door sill for tight fit.

6. Provide non-corroding fasteners at exterior locations.

## **2.14 WEATHERSTRIPPING AND GASKETING**

### **A. Manufacturers:**

1. Pemko; an Assa Abloy Group company: [www.assaabloydss.com](http://www.assaabloydss.com).
2. Hager Companies: [www.hagerco.com](http://www.hagerco.com).
3. National Guard Products, Inc: [www.ngpinc.com](http://www.ngpinc.com).
4. Reese Enterprises, Inc: [www.reeseusa.com](http://www.reeseusa.com).
5. Zero International, Inc: [www.zerointernational.com](http://www.zerointernational.com).
6. Substitutions: Not permitted.

### **B. Weatherstripping and Gasketing: Comply with BHMA A156.22.**

1. Head and Jamb Type: Adjustable.
2. Door Sweep Type: Encased in retainer.
3. Material: Aluminum, with neoprene weatherstripping.
4. Provide weatherstripping on each exterior door at head, jambs, and meeting stiles of door pairs, unless otherwise indicated.
5. Provide door bottom sweep on each exterior door, unless otherwise indicated.

## **2.15 LATCH PROTECTOR**

### **A. Manufacturers:**

1. Don-Jo Manufacturing, Inc: [www.don-jo.com](http://www.don-jo.com).
2. Rockwood; an Assa Abloy Group company: [www.assaabloydss.com](http://www.assaabloydss.com).
3. Substitutions: See Section 01 60 00 - Product Requirements.

### **B. Latch Protector: Provide on door to protect latch from being tampered with while in locked position.**

1. Type: Standard latch protector.
2. Material: Stainless steel.

## **2.16 SILENCERS**

### **A. Provide at equal locations on door frame to mute sound of door's impact upon closing.**

1. Single Door: Provide three on strike jamb of frame.
2. Material: Rubber, gray color.

## **2.17 POWER SUPPLY**

### **A. Power Supply: Hard wired, with multiple zones providing eight (8) breakers for each output panel with individual control switches and LED's; UL (DIR) Class 2 listed.**

1. Power: 12/24 VAC, 10 Amp; with 120 VAC power supply, to match requirements of powered devices.
2. Operating Temperature: 32 to 110 degrees F.
3. Provide with emergency release terminals that release devices upon activation of fire alarm system.

## **2.18 FINISHES**

### **A. Finishes: Match existing door hardware.**

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.
- B. Verify that electric power is available to power operated devices and of correct characteristics.

### **3.02 INSTALLATION**

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Use templates provided by hardware item manufacturer.
- C. Do not install surface mounted items until application of finishes to substrate are fully completed.
- D. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list; unless noted otherwise in Door Hardware Schedule or on drawings.
  - 1. For Steel Doors and Frames: See Section 08 11 13.
  - 2. For Aluminum-Framed Storefront Doors and Frames: See Section 08 43 13.
  - 3. Flush Wood Doors: See Section 08 14 16.
  - 4. Mounting heights in compliance with ADA Standards:
    - a. Locksets: 40-5/16 inch.
    - b. Push Plates/Pull Bars: 42 inch.
    - c. Deadlocks (Deadbolts): 48 inch.
    - d. Exit Devices: 40-5/16 inch.
- E. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

### **3.03 FIELD QUALITY CONTROL**

- A. Provide an Architectural Hardware Consultant (AHC) to inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

### **3.04 ADJUSTING**

- A. Adjust work under provisions of Section 01 70 00 - Execution and Closeout Requirements.
- B. Adjust hardware for smooth operation.
- C. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

### **3.05 CLEANING**

- A. Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.
- B. Clean adjacent surfaces soiled by hardware installation.

### **3.06 PROTECTION**

- A. Protect finished Work under provisions of Section 01 70 00 - Execution and Closeout Requirements.
- B. Do not permit adjacent work to damage hardware or finish.

**END OF SECTION**

**SECTION 08 71 13  
POWER DOOR OPERATORS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Operators for swinging doors.
- B. Controllers, actuators, and safety devices.
- C. Maintenance.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 71 00 - Door Hardware: Balance of door hardware.
- B. Section 26 05 83 - Wiring Connections.
- C. Section 28 46 00 - Fire Detection and Alarm: Connection to fire alarm system.

**1.03 DEFINITIONS**

- A. Activation Device: Device that sends an electrical signal to door operator to open door when actuated.
- B. Knowing Act: Consciously initiating the opening of a power-operated door using acceptable methods, including wall-mounted switches such as push plates and controlled access devices such as keypads, card readers, and key switches.

**1.04 REFERENCE STANDARDS**

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. BHMA A156.19 - Power Assist and Low Energy Power Operated Swinging Doors; 2019.
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

**1.05 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination: Coordinate power door operators with balance of door hardware and electrical work required for each affected door opening.
  - 1. Templates: Check other sections' shop drawings to confirm that adequate provisions are in place for locating and installing power door operators.
  - 2. Electrical System Roughing-in: Coordinate layout and installation of power door operators with connections to power supplies, remote activation devices, and electric door latching hardware.
- B. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; require attendance by affected installers and the following parties.
  - 1. Architect/Engineer.
  - 2. Installer's Architectural Hardware Consultant (AHC).
  - 3. Owner's Security Consultant.

## 1.06 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Shop Drawings:
  - 1. Indicate layout and dimensions; head conditions; elevations; components, anchorage, recesses, materials, and finishes, electrical characteristics and connection requirements.
  - 2. Identify installation tolerances required, assembly conditions, routing of service lines and conduit, and locations of operating components and boxes.
- C. Product Data: Provide data on system components, sizes, features, and finishes.
- D. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and manufacturer's hardware and component templates.
- E. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.
- F. Maintenance Data: Include manufacturer's parts list and maintenance instructions for each type of hardware and operating component.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. Wrenches and other tools required for maintenance of equipment.

## 1.07 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years experience and approved by manufacturer.

## 1.08 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide standard (1-year or 2-year) manufacturer warranty for components of power door operators. Complete forms in Owner's name and register with manufacturer.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Operators for Swinging Doors:
  - 1. ASSA ABLOY Entrance Solutions; Besam SW200i: [www.besam-usa.com](http://www.besam-usa.com).
  - 2. dormakaba Group; ED250: [www.dormakaba.com](http://www.dormakaba.com).
  - 3. LCN, an Allegion brand; 9540 Senior Swing: [www.allegion.com/us](http://www.allegion.com/us).
  - 4. Horton Automatics; S4100LE: [www.hortondoors.com](http://www.hortondoors.com).
  - 5. NABCO Entrances Inc; GT 500 Low Energy (ADA) Automatic Door: [www.nabcoentrances.com](http://www.nabcoentrances.com).
  - 6. record-usa; 8100 Series Swing Door: [www.recorddoors.com](http://www.recorddoors.com).
  - 7. Stanley Access Technologies; M-Force: [www.stanleyaccess.com](http://www.stanleyaccess.com).
  - 8. Substitutions: Not permitted.



## 2.02 POWER DOOR OPERATORS - GENERAL

- A. Electrically Operated or Controlled Hardware: Provide necessary power supplies, relays, and interfaces as required for proper operation; provide wiring between control components and to building power connection in compliance with NFPA 70.
- B. Comply with ADA Standards for egress requirements.
- C. Comply with NFPA 101 and requirements of authorities having jurisdiction; provide units selected for actual door weight and for light pedestrian traffic unless otherwise indicated.
- D. Exterior and Vestibule Doors: Provide equipment suitable for ambient operating temperature range of minus 20 to plus 140 degrees F.
- E. Exterior Doors: Provide units capable of operating, closing, and holding doors closed under positive and negative differential pressure; if necessary, provide power closing.
- F. System Integration: Integrate operator functionality with other systems as required for a complete working installation.
  - 1. Provide time delay relay to signal automatic door operator to activate only after electric lock system is released.
  - 2. Provide fire alarm interface configurable to safely open or close doors on signal from fire alarm system.
    - a. See Section 28 46 00.
  - 3. Provide controller output signals at the door closed or door open positions to facilitate interaction with security and access control systems.

## 2.03 OPERATORS FOR SWINGING DOORS

- A. Door Operator: Electromechanical.
  - 1. Applications: Include operators for single doors.
  - 2. Electromechanical Operators: 1/4 hp minimum, self-contained.
  - 3. Speed Control: Variable, field-adjustable opening and closing cycles.
  - 4. Functionality: Low-energy power open, spring close with power assist operation.
    - a. Low-Energy Power Operators: Comply with BHMA A156.19; operator activated by pushing or pulling the door or by manual actuator, not a sensor; safeties not required.
      - 1) Kinetic Energy of Door in Motion: 1.25 lbf ft, maximum.
      - 2) Force Required to Prevent Stopped Door From Opening or Closing: 15 lbf, maximum, measured at 1 inch from the latch edge of the door at any point in the swing cycle.
      - 3) Force Required to Release Latch When Unpowered: 15 lbf, maximum, measured at 1 inch from the latch edge of the door at any point in the swing cycle.
      - 4) Force Required to Set Door in Motion When Unpowered: 30 lbf, maximum, measured at 1 inch from the latch edge of the door at any point in the closing cycle.
      - 5) Force Required to Fully Open Door When Unpowered: 15 lbf, maximum, measured at 1 inch from the latch edge of the door at any point in the closing cycle.
      - 6) Signage: Provide signage in accordance with BHMA A156.19.
  - 5. Mounting: Surface mounted overhead.
  - 6. Components:
    - a. Header Case: Manufacturer's standard extruded aluminum profile containing door operator and door mounting components.

- b. Motor and Gearbox Assembly: Manufacturer's standard sealed motor, gearbox, and drive belt.
- 7. Power Supply Units: Self-contained, electrically operated, and integrated with door operator.
- 8. Actuators: Manufacturer's standard.
  - a. Actuator Types: As indicated on drawings.
- 9. Hold Open: Toggle switch at inside head of doors.

## **2.04 CONTROLLERS, ACTUATORS, AND SAFETY DEVICES**

- A. Controllers: Manufacturer's standard for products specified.
  - 1. Provide microprocessor operated controller for each door.
- B. Actuators: Manufacturer's standard for products specified and as specified below.
  - 1. Push Plate Actuator: Standard, frame mounted, recessed, momentary contact type; satin stainless steel plate; labeled PUSH.

## **2.05 ELECTRICAL CHARACTERISTICS AND COMPONENTS**

- A. Electrical Characteristics:
  - 1. 1/4 hp.
  - 2. 115 volts, single phase, 60 Hz.
  - 3. 15 amperes maximum fuse size.
  - 4. See also Section 26 05 83 - Wiring Connections.
- B. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70.
- C. Disconnect Switch: Factory mount disconnect switch in control panel.

## **2.06 FINISHES**

- A. Aluminum Finishes: Manufacturer's standard.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify installation conditions including, but not limited to the following: opening sizes, floor conditions, plumb and level mounting surfaces.
- B. Verify that surfaces are ready to receive work and dimensions are as indicated on shop drawings.
- C. Verify that electric power is available, in the correct location, and of the correct characteristics.

### **3.02 INSTALLATION**

- A. Coordinate installation of components with related and adjacent work.
- B. Install equipment in accordance with manufacturer's instructions.
- C. Provide for thermal expansion and contraction of door and frame units and live and dead loads that may be transmitted to operating equipment.
- D. Provide for dimensional distortion of components during operation.

### **3.03 ADJUSTING**

A. Adjust door equipment for correct function and smooth operation.

### **3.04 CLEANING**

A. Remove temporary protection, clean exposed surfaces.

### **3.05 CLOSEOUT ACTIVITIES**

A. Demonstrate to Owner's representative equipment operation, operating components, adjustment features, and lubrication requirements.

### **3.06 MAINTENANCE**

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements relating to maintenance service.

B. Provide service and maintenance of operating equipment for one year from Date of Substantial Completion, at no extra charge to Owner.

**END OF SECTION**

**SECTION 08 80 00  
GLAZING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Insulating glass units.
- B. Glazing units.
- C. Glazing compounds.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 92 00 - Joint Sealants: Sealants for other than glazing purposes.
- B. Section 08 14 16 - Flush Wood Doors: Glazed lites in doors.
- C. Section 08 43 13 - Aluminum-Framed Storefronts: Glazing provided as part of storefront assembly.

**1.03 REFERENCE STANDARDS**

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).
- C. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).
- D. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.
- E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).
- F. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2021a.
- G. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2016.
- H. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2019.
- I. GANA (GM) - GANA Glazing Manual; 2022.
- J. GANA (SM) - GANA Sealant Manual; 2008.
- K. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2023.
- L. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2023.
- M. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2023.

**1.04 ADMINISTRATIVE REQUIREMENTS**

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

## **1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data on Insulating Glass Unit and Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Samples: Submit two samples 12 inches by 12 inch in size of glass units.
- E. Certificate: Certify that products of this section meet or exceed specified requirements.
- F. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

## **1.06 QUALITY ASSURANCE**

- A. Perform Work in accordance with GANA (GM) and GANA (SM) for glazing installation methods.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years of experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years experience.
  - 1. Provide company, field supervisors, and installers that hold active ANSI accredited certifications in appropriate categories for work specified.
    - a. North American Contractor Certification (NACC) for glazing contractors.
    - b. Equivalent independent third-party ANSI accredited certification.

## **1.07 FIELD CONDITIONS**

- A. Do not install glazing when ambient temperature is less than 40 degrees F.

## **1.08 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Insulating Glass Units: Provide a ten (10) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

## **PART 2 PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES**

- A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
  - 1. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
  - 2. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
  - 3. Glass thicknesses listed are minimum.

- B. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.
  - 1. In conjunction with weather barrier related materials described in other sections, as follows:
- C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
  - 1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
  - 2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
  - 3. Solar Optical Properties: Comply with NFRC 300 test method.

## 2.02 GLASS MATERIALS

- A. Float Glass: Provide float glass based glazing unless otherwise indicated.
  - 1. Kind FT - Fully Tempered Type: Complies with ASTM C1048.
    - a. Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.
    - b. Complies with ANSI Z97.1 - Class A and 16 CFR 1201 - Category II criteria.
  - 2. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.

## 2.03 INSULATING GLASS UNITS

- A. Insulating Glass Units: Types as indicated.
  - 1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
  - 2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
  - 3. Metal-Edge Spacers: Stainless steel, bent and spot welded corners.
  - 4. Edge Seal:
    - a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.
    - b. Color: Black.
  - 5. Purge interpane space with dry air, hermetically sealed.
- B. Type SG1 - Insulating Glass Units: Vision glass, double glazed.
  - 1. Applications: Exterior glazing unless otherwise indicated.
  - 2. Space between lites filled with argon.
  - 3. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
    - a. Tint: Clear.
    - b. Coating: Low-E (passive type), on #2 surface.
  - 4. Metal edge spacer.
  - 5. Inboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
    - a. Tint: Clear.
  - 6. Total Thickness: 1 inch.

7. Thermal Transmittance (U-Value), Winter - Center of Glass: 0.24, maximum.
8. Solar Heat Gain Coefficient (SHGC): 0.38, maximum.

## **2.04 GLAZING UNITS**

- A. Type FG1 - Monolithic Interior Vision Glazing:
  1. Applications: Interior glazing unless otherwise indicated.
  2. Glass Type: Fully tempered float glass.
  3. Tint: Clear.
  4. Thickness: 1/4 inch, nominal.

## **2.05 ACCESSORIES**

- A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II.  
Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.
- B. Glazing Tape: Closed cell polyvinyl chloride (PVC) foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent, designed for compression of 25 percent to effect an air barrier and vapor retarder seal.
- C. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.

## **PART 3 EXECUTION**

### **3.01 VERIFICATION OF CONDITIONS**

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that the minimum required face and edge clearances are being provided.
- C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.
- D. Verify that sealing between joints of glass framing members has been completed effectively.
- E. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

### **3.03 INSTALLATION, GENERAL**

- A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.

- B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.
- C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.
- D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.
- E. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.
- F. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, and paint.

#### **3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)**

- A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

#### **3.05 INSTALLATION - DRY GLAZING METHOD (TAPE AND TAPE)**

- A. Application - Interior Glazed: Set glazing infills from the interior of the building.
- B. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.
- C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- D. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
- E. Place glazing tape on free perimeter of glazing in same manner described above.
- F. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- G. Carefully trim protruding tape with knife.

#### **3.06 CLEANING**

- A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- B. Remove nonpermanent labels immediately after glazing installation is complete.
- C. Clean glass and adjacent surfaces after sealants are fully cured.
- D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.



### **3.07 PROTECTION**

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.
- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

**END OF SECTION**

**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.
  - 2. Carpet tile.
  - 3. Thin-set ceramic tile and stone tile.
  - 4. Fluid-applied flooring.
- 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.
- F. Patching compound.
- G. Remedial floor coatings.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 40 00 - Quality Requirements: Additional requirements relating to testing agencies and testing.
- B. Section 03 30 00 - Cast-in-Place Concrete: Concrete admixture for slabs to receive adhered flooring, to prevent moisture content-related flooring failures.

**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 F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.
- C. 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. Visual Observation Report: For existing floor coverings to be removed.
- B. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
  - 1. Moisture and alkalinity (pH) limits and test methods.
  - 2. Manufacturer's required bond/compatibility test procedure.

- C. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.
  - 1. Manufacturer's qualification statement.
  - 2. Certificate: Manufacturer's certification of compatibility with types of flooring applied over remedial product.
  - 3. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.
  - 4. Manufacturer's installation instructions.
  - 5. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.
- D. Adhesive Bond and Compatibility Test Report.
- E. Copy of RFCI (RWP).

## **1.06 QUALITY ASSURANCE**

- A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.
- B. Contractor may perform adhesive and bond test with Contractor's own personnel or hire a testing agency.
- C. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission coatings.

## **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.
1. Thickness: As required for application and in accordance with manufacturer's installation instructions.
  2. Use product recommended by testing agency.

## **PART 3 EXECUTION**

### **3.01 CONCRETE SLAB PREPARATION**

- A. Follow recommendations of testing agency.
- B. 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. Specified remediation, if required.
  5. Patching, smoothing, and leveling, as required.
  6. Other preparation specified.
  7. Adhesive bond and compatibility test.
  8. Protection.
- C. 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 (RWP), 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 PREPARATION**

- A. See individual floor covering section(s) for additional requirements.
- B. Comply with recommendations of testing agency.
- C. Comply with requirements and recommendations of floor covering manufacturer.
- D. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.
- E. Do not fill expansion joints, isolation joints, or other moving joints.

### **3.05 ADHESIVE BOND AND COMPATIBILITY TESTING**

- A. Comply with requirements and recommendations of floor covering manufacturer.

### **3.06 APPLICATION OF REMEDIAL FLOOR COATING**

- A. Comply with requirements and recommendations of coating manufacturer.

### **3.07 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. Gypsum sheathing.
- B. Cementitious backing board.
- C. Gypsum wallboard.
- D. Joint treatment and accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.
- B. Section 07 92 00 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.
- C. Section 09 30 00 - Tiling: Tile backing board.

**1.03 REFERENCE STANDARDS**

- A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).
- B. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.
- C. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2018.
- D. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2019.
- E. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- F. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2023.
- G. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2022, with Editorial Revision (2023).
- H. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.
- I. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
- J. GA-216 - Application and Finishing of Gypsum Panel Products; 2021.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data:
  - 1. Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

## 1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

## 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store gypsum products and accessories indoors and keep above freezing. Elevate boards above floor, on nonwicking supports, in accordance with manufacturer's recommendations.

## PART 2 PRODUCTS

### 2.01 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C840 and GA-216.

### 2.02 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
  - 1. American Gypsum Company: [www.americangypsum.com](http://www.americangypsum.com).
  - 2. CertainTeed Corporation: [www.certainteed.com](http://www.certainteed.com).
  - 3. Georgia-Pacific Gypsum: [www.gpgypsum.com](http://www.gpgypsum.com).
  - 4. National Gypsum Company: [www.nationalgypsum.com/](http://www.nationalgypsum.com/).
  - 5. USG Corporation: [www.usg.com](http://www.usg.com).
  - 6. 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 all locations.
  - 3. Thickness:
    - a. Vertical Surfaces: 5/8 inch.
    - b. Ceilings: 5/8 inch.
  - 4. Mold-Resistant, Paper-Faced Products:
    - a. American Gypsum Company; M-Bloc Type X: [www.americangypsum.com](http://www.americangypsum.com).
    - b. American Gypsum Company; M-Bloc Type C: [www.americangypsum.com](http://www.americangypsum.com).
    - c. CertainTeed Corporation; M2Tech 5/8" Type X Moisture & Mold Resistant Drywall: [www.certainteed.com](http://www.certainteed.com).
    - d. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard: [www.gpgypsum.com](http://www.gpgypsum.com).
    - e. National Gypsum Company; Gold Bond XP Gypsum Board: [www.nationalgypsum.com](http://www.nationalgypsum.com).
    - f. USG Corporation; USG Sheetrock Brand EcoSmart Panels Mold Tough Firecode X: [www.usg.com](http://www.usg.com).
    - g. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Backing Board For Vertical Tiled Surfaces:
  - 1. Application: Surfaces behind tile in wet and non-wet areas, including, but not limited to, restrooms.
  - 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
  - 3. 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.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

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

### **3.02 BOARD INSTALLATION**

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Single-Layer Nonrated: Install gypsum board 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.
- C. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

### **3.03 INSTALLATION OF TRIM AND ACCESSORIES**

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
  - 1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

### **3.04 JOINT TREATMENT**

- A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
  - 1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
  - 2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
- B. 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.
  - 2. Taping, filling, and sanding are not required at base layer of double-layer applications.
- C. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.
- D. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

### **3.05 TOLERANCES**

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

**END OF SECTION**



**SECTION 09 30 00  
TILING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Tile for floor applications.
- B. Tile for wall applications.
- C. Cementitious backer board as tile substrate.
- D. Ceramic trim.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 92 00 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.
- B. Section 09 21 16 - Gypsum Board Assemblies: Tile backer board.

**1.03 REFERENCE STANDARDS**

- A. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2017 (Reaffirmed 2022).
- B. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 2017.
- C. ANSI A108.1c - Contractor's Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2021).
- D. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesive or Water Cleanable Tile-Setting Epoxy Adhesive; 2019.
- E. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 2021.
- F. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grout Epoxy; 1999 (Reaffirmed 2019).
- G. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2019).
- H. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 1999 (Reaffirmed 2019).
- I. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 2017 (Reaffirmed 2022).
- J. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2018.
- K. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar; 1999 (Reaffirmed 2019).

- L. ANSI A108.19 - American National Standard Specifications for Interior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by the Thin-Bed Method Bonded with Modified Dry-Set Cement Mortar or Improved Modified Dry-Set Cement Mortar; 2020.
- M. ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar; 2019.
- N. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2022.
- O. ASTM C373 - Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products; 2018 (Reapproved 2023).
- P. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2023.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

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

#### **1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, ceramic accessories, setting details, and trim components.
- D. Samples for Selection: Manufacturer's color line sample boards/books.
- E. Samples for Verification: Mount selected tile and apply grout on two plywood panels, minimum 18 x 18 inches in size illustrating pattern, color variations, and grout joint size variations.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- G. Master Grade Certificate: Submit for each type of tile, signed by the tile manufacturer and tile installer.
- H. Installer's Qualification Statement:
  - 1. Submit documentation of National Tile Contractors Association (NTCA) or Tile Contractors' Association of America (TCAA) accreditation.
  - 2. Submit documentation of completion of apprenticeship and certification programs.
- I. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.
- J. 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 Tile: 10 square feet of each size, color, and surface finish combination.

## 1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.
- B. Installer Qualifications:
  - 1. Company specializing in performing tile installation, with minimum of five years of documented experience.
    - a. Accredited Five-Star member of the National Tile Contractors Association (NTCA) or Trowel of Excellence member of the Tile Contractors' Association of America (TCAA).
  - 2. Installer Certification:
    - a. Ceramic Tile Education Foundation (CTEF): Certified Tile Installer (CTI).
    - b. Apprenticeship Program: Installer has achieved Journeyworker status through an apprenticeship from the International Union of Bricklayers and Allied Craftworkers (IUBAC) or a U.S. Department of Labor (DOL)-recognized program.
    - c. Advanced Certifications for Tile Installers (ACT): Certification in the installation of membranes, mortar bed (mud) floors, mortar (mud) walls, large format tile, gauged porcelain tile/panels/slabs, and grouts.
    - d. International Masonry Training and Education Foundation (IMTEF): Supervisor Certification Program (SCP).

## 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

## 1.08 FIELD CONDITIONS

- A. Do not install solvent-based products in an unventilated environment.
- B. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

## PART 2 PRODUCTS

### 2.01 TILE

- A. Manufacturers: All products by the same manufacturer.
  - 1. American Olean Corporation: [www.americanolean.com](http://www.americanolean.com).
  - 2. Crossville, Inc: [www.crossvilleinc.com](http://www.crossvilleinc.com).
  - 3. Dal-Tile Corporation: [www.daltile.com](http://www.daltile.com).
  - 4. Summitville Tiles, Inc: [www.summitville.com](http://www.summitville.com).
  - 5. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Porcelain Tile, Type TFA/WTA: ANSI A137.1, standard grade.
  - 1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
  - 2. Size: 12 by 24 inch, nominal.
  - 3. Thickness: 3/8 inch.
  - 4. Edges: Square.
  - 5. Surface Finish: Unglazed.
  - 6. Color(s): As shown on the Drawings.
  - 7. Pattern: As shown on the Drawings. No special cuts.

8. Trim Units: Matching bullnose and surface bullnose shapes in sizes indicated.

## **2.02 TRIM AND ACCESSORIES**

- A. Non-Ceramic Trim: Brushed stainless steel or satin natural anodized extruded aluminum, style and dimensions to suit application, for setting using tile mortar or adhesive.
  - 1. Applications:
    - a. Open edges of wall tile.
    - b. Open edges of floor tile.
  - 2. Manufacturers:
    - a. Schluter-Systems: [www.schluter.com](http://www.schluter.com).
    - b. Substitutions: Not permitted.

## **2.03 SETTING MATERIALS**

- A. Provide setting and grout materials from same manufacturer.

## **2.04 GROUTS**

- A. Manufacturers:
  - 1. Bostik Inc: [www.bostik-us.com](http://www.bostik-us.com).
  - 2. Custom Building Products: [www.custombuildingproducts.com/#sle](http://www.custombuildingproducts.com/#sle).
  - 3. LATICRETE International, Inc; LATICRETE PERMACOLOR Grout: [www.laticrete.com](http://www.laticrete.com).
- B. High Performance Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.
  - 1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
  - 2. Color(s): As indicated on drawings.

## **2.05 ACCESSORY MATERIALS**

- A. Backer Board: Cementitious type complying with ANSI A118.9; high density, glass fiber reinforced, 7/16 inch thick; 2 inch wide coated glass fiber tape for joints and corners.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.

### **3.02 PREPARATION**

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

- D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.

### **3.03 INSTALLATION - GENERAL**

- A. Install tile and thresholds and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.20, manufacturer's instructions, and TCNA (HB) recommendations.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- E. Form internal angles square and external angles bullnosed.
- F. Install non-ceramic trim in accordance with manufacturer's instructions.
- G. Sound tile after setting. Replace hollow sounding units.
- H. Keep control and expansion joints free of mortar, grout, and adhesive.
- I. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- J. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.
- K. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.
- L. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

### **3.04 INSTALLATION - FLOORS - THIN-SET METHODS**

- A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, with standard grout, unless otherwise indicated.
  - 1. Use uncoupling membrane under all tile unless other underlayment is indicated.

### **3.05 INSTALLATION - WALL TILE**

- A. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244.

### **3.06 CLEANING**

- A. Clean tile and grout surfaces.

### **3.07 PROTECTION**

- A. Do not permit traffic over finished floor surface for 4 days after installation.

**END OF SECTION**

**SECTION 09 65 00  
RESILIENT FLOORING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Resilient sheet flooring.
- B. Resilient base.
- C. Installation accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied resilient flooring.
- C. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.

**1.03 REFERENCE STANDARDS**

- A. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile; 2004 (Reapproved 2018).
- B. ASTM F1303 - Standard Specification for Sheet Vinyl Floor Covering with Backing; 2004 (Reapproved 2021).

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Shop Drawings: Indicate seaming plans and floor patterns.
- D. Selection Samples: Submit manufacturer's complete set of color samples for Architect/Engineer's initial selection.
- E. Verification Samples: Submit two samples, 12 by 12 inch in size illustrating color and pattern for each resilient flooring product specified.
- F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- G. 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 Flooring Material: 100 square feet of each type and color.
  - 3. Extra Wall Base: 100 linear feet of each type and color.
  - 4. Extra Stair Materials: Quantity equivalent to 5 percent of each type and color.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Store all materials off of the floor in an acclimatized, weather-tight space.

- B. Protect rolled sheet materials from damage by storing on end.

## **1.06 FIELD CONDITIONS**

- A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- B. 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 SHEET FLOORING**

- A. Vinyl Sheet Flooring - RFA: Color and pattern throughout wear layer thickness, with backing.
  1. Minimum Requirements: Comply with ASTM F1303, Type II, with Class A fibrous backing.
  2. Wear Layer Thickness: 0.032 inch minimum.
  3. Total Thickness: 0.080 inch minimum.
  4. Sheet Width: 72 inch minimum.
  5. Pattern: TBD.
  6. Color: To be selected by Architect/Engineer from manufacturer's full range.

## **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. Verify that concrete sub-floor surfaces are dry enough and ready for resilient flooring installation by testing for moisture emission rate and alkalinity in accordance with ASTM F710; obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
- D. Verify that required floor-mounted utilities are in correct location.

### **3.02 PREPARATION**

- A. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor filler to achieve smooth, flat, hard surface.
- B. Prohibit traffic until filler is fully cured.
- C. Clean substrate.

### **3.03 INSTALLATION - GENERAL**

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install in accordance with manufacturer's written instructions.
- C. Adhesive-Applied Installation:

1. Spread only enough adhesive to permit installation of materials before initial set.
  2. Fit joints and butt seams tightly.
  3. Set flooring in place, press with heavy roller to attain full adhesion.
- D. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
- E. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
- F. Scribe flooring to walls and other appurtenances to produce tight joints.

### **3.04 INSTALLATION - SHEET FLOORING**

- A. Lay flooring with joints and seams parallel to longer room dimensions, to produce minimum number of seams. Lay out seams to avoid widths less than 1/3 of roll width; match patterns at seams.

### **3.05 CLEANING**

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's written instructions.

### **3.06 PROTECTION**

- A. Prohibit traffic on resilient flooring for 48 hours after installation.

**END OF SECTION**



**SECTION 09 67 00  
FLUID-APPLIED FLOORING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Fluid-applied flooring and base.

**1.02 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.
- C. Samples: Submit two samples, 6 x 6 inch in size illustrating color and pattern for each floor material for each color specified.
- D. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and application rate for each coat.
- E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.

**1.03 QUALITY ASSURANCE**

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

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Store resin materials in a dry, secure area.
- B. Store materials for three days prior to installation in area of installation to achieve temperature stability.

**1.05 FIELD CONDITIONS**

- A. Maintain minimum temperature in storage area of 55 degrees F.
- B. Store materials in area of installation for minimum period of 24 hours prior to installation.
- C. Maintain ambient temperature required by manufacturer 72 hours prior to, during, and 24 hours after installation of materials.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Fluid-Applied Flooring:
  - 1. Crown Polymers, LLC: [www.crownpolymers.com](http://www.crownpolymers.com).
  - 2. Crossfield Products Corp: [www.crossfieldproducts.com](http://www.crossfieldproducts.com).
  - 3. Dur-A-Flex, Inc.: [www.dur-a-flex.com](http://www.dur-a-flex.com).
  - 4. Sika Corporation: [www.sikafloorusa.com](http://www.sikafloorusa.com).
  - 5. Stonhard/StonCor Group: [www.stonhard.com](http://www.stonhard.com).
  - 6. Substitutions: Not permitted.

## 2.02 FLUID-APPLIED FLOORING SYSTEMS

- A. Fluid-Applied Flooring Type EBA: Epoxy, two component, thermosetting, colored with mineral filler, with aggregate broadcast on base coat.
  - 1. Base Coat: 1/8 inch thick; color as selected.
  - 2. Aggregate: Small quartz chips, multiple colors as selected.
  - 3. Top Coats: Epoxy, two component, thermosetting; clear.
  - 4. Mildew Resistance: No growth.
  - 5. Color: Selected by Architect from manufacturer's full line.
  - 6. Basis of Design Product: Stonhard; Stonshield SLT: [www.stonhard.com](http://www.stonhard.com).
  - 7. Other Acceptable Products:
    - a. Crossfield Products Corp.; Dex-O-Tex Decor-Flor: [www.dex-o-tex.com](http://www.dex-o-tex.com).
    - b. Crown Polymers Corp.; CrownQuartz: [www.crownpolymers.com](http://www.crownpolymers.com).
    - c. Dur-A-Flex; Dur-A-Quartz: [www.dur-a-flex.com](http://www.dur-a-flex.com).
    - d. Sika Industrial Flooring; Sikafloor Quartzite: [www.sikafloorusa.com](http://www.sikafloorusa.com).

## 2.03 ACCESSORIES

- A. Cant Strips: Molded of flooring resin material.
- B. Subfloor Filler: Type recommended by fluid-applied flooring manufacturer.
- C. Primer: Type recommended by fluid-applied flooring manufacturer.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive flooring.
- 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 flooring.
- C. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of materials to subfloor surfaces.
- D. Verify that required floor-mounted utilities are in correct location.
- E. Verify that in-floor drains are installed at the correct elevation.

### 3.02 PREPARATION

- A. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.
- B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind irregularities above the surface level. Prohibit traffic until filler is cured.
- C. Vacuum clean substrate.
- D. Apply primer to surfaces required by flooring manufacturer.

### **3.03 INSTALLATION - FLOORING**

- A. Apply in accordance with manufacturer's instructions.
- B. Apply each coat to minimum thickness required by manufacturer.
- C. Finish to smooth level surface.
- D. Cove at vertical surfaces.

### **3.04 PROTECTION**

- A. Prohibit traffic on floor finish for 48 hours after installation.
- B. Barricade area to protect flooring until fully cured.

**END OF SECTION**

**SECTION 09 68 13  
TILE CARPETING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Carpet tile, fully adhered.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.
- C. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

**1.03 REFERENCE STANDARDS**

- A. CRI 104 - Standard for Installation of Commercial Carpet; 2015.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- C. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
- D. Manufacturer's Qualification Statement.
- E. Operation and Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
  - 2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.

**PART 2 PRODUCTS**

**2.01 MATERIALS**

- A. Tile Carpeting, Type CPTA: Tufted, manufactured in one color dye lot.
  - 1. Product: Color Balance manufactured by Mohawk.

2. Tile Size: 12 by 36 inch, nominal.
  3. Color: From Manufactures' full color range.
  4. Pattern: Textured Patterned Loop.
  5. Primary Backing Material: EcoFlex.
- B. Walk-off Tile Carpeting, Type[CPTB]: Tufted, manufactured in one color dye lot.
1. Product: Tuff Stuff manufactured by Mohawk].
  2. Tile Size: 24 by 24 inch, nominal.
  3. Color: From Manufactures' full color range.
  4. Pattern: Step Up II - Performance Tip Shear.

## **2.02 ACCESSORIES**

- A. Edge Strips: Rubber, color as selected by Architect.
- B. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive carpet tile.
- C. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.

### **3.02 PREPARATION**

- A. Prepare floor substrates for installation of flooring in accordance with Section 09 05 61.

### **3.03 INSTALLATION**

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install carpet tile in accordance with manufacturer's instructions.
- C. Blend carpet from different cartons to ensure minimal variation in color match.
- D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- E. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines.
- F. Trim carpet tile neatly at walls and around interruptions.
- G. Complete installation of edge strips, concealing exposed edges.

### **3.04 CLEANING**

- A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.
- B. Remove excess adhesive without damage, from floor, base, and wall surfaces.

C. Clean and vacuum carpet surfaces.

**END OF SECTION**

**SECTION 09 90 00  
PAINTING AND COATING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Surface preparation.
- B. Interior painting and coating systems.
- C. Exterior painting and coating systems.
- D. Scope:
  - 1. Finish surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
    - a. Exterior:
      - 1) Wood: Siding, trim, beams, sashes, and hardboard-bare/primed.
    - b. Interior:
      - 1) Wood: Walls, interior window surfaces.
      - 2) Drywall: Walls, ceilings, gypsum board, and similar items.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

**1.03 REFERENCE STANDARDS**

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
- C. SSPC-SP 2 - Hand Tool Cleaning; 2018.
- D. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
  - 1. Product characteristics.
  - 2. Surface preparation instructions and recommendations.
  - 3. Primer requirements and finish specification.
  - 4. Storage and handling requirements and recommendations.
  - 5. Application methods.
  - 6. Clean-up information.
- C. Samples: Submit four paper draw down samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
- D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.
- E. Maintenance Data: Submit coating maintenance manual including finish schedule showing where each product/color/finish was used, product technical data sheets, 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.

- 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 Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
  - 3. Label each container with color in addition to manufacturer's label.

### **1.05 QUALITY ASSURANCE**

- A. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 3 years experience and approved by manufacturer.

### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, product name, product code, color designation, VOC content, batch date, environmental handling, surface preparation, application, and use instructions.
- C. Paint Materials: Store at a minimum of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.
- D. Handling: Maintain a clean, dry storage area to prevent contamination or damage to materials.

### **1.07 FIELD CONDITIONS**

- A. Do not apply materials when environmental conditions are outside the ranges required by manufacturer.
- B. Follow manufacturer's recommended procedures for producing the best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Basis of Design Products: Subject to compliance with requirements, provide Sherwin-Williams Company (The) products indicated; [www.sherwin-williams.com/#sle](http://www.sherwin-williams.com/#sle).

### **2.02 PAINTINGS AND COATINGS**

- A. General:
  - 1. Provide factory-mixed coatings unless otherwise indicated.
  - 2. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application.
  - 3. Do not reduce, thin, or dilute coatings or add materials to coatings unless specifically indicated in manufacturer's instructions.
- B. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.



## 2.03 PAINT SYSTEMS - EXTERIOR

- A. Wood: Siding, trim, beams, sashes, and hardboard-bare/primed.
  - 1. Latex Systems:
    - a. Flat Finish:
      - 1) 1st Coat: Sherwin-Williams Latex Wood Primer, B42W8041: [www.sherwin-williams.com](http://www.sherwin-williams.com).
      - a) 4 mils wet, 1.4 mils dry per coat.
      - 2) 2nd and 3rd Coat: Sherwin-Williams A-100 Exterior Latex Flat, A6 Series: [www.sherwin-williams.com](http://www.sherwin-williams.com).
      - a) 4 mils wet, 1.2 mils dry per coat.

## 2.04 PAINT SYSTEMS - INTERIOR

- A. Metal: Miscellaneous and ferrous metal.
  - 1. Alkyd Systems, Water Based:
    - a. Semi-Gloss Finish:
      - 1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: [www.sherwin-williams.com](http://www.sherwin-williams.com).
      - a) 5 mils wet, 2 mils dry per coat.
      - 2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: [www.sherwin-williams.com](http://www.sherwin-williams.com).
      - a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.
- B. Wood: Walls and trim.
  - 1. Latex Systems:
    - a. Semi-Gloss Finish:
      - 1) 1st Coat: Sherwin-Williams Premium Wall and Wood Primer, B28W8111: [www.sherwin-williams.com](http://www.sherwin-williams.com).
      - a) 4 mils wet, 1.8 mils dry per coat.
      - 2) 2nd and 3rd Coat: Sherwin-Williams ProClassic Waterborne Acrylic Semi-Gloss, B31 Series: [www.sherwin-williams.com](http://www.sherwin-williams.com).
      - a) 4 mils wet, 1.3 mils dry per coat.
- C. Drywall: Walls, ceilings, gypsum board, and similar items.
  - 1. Latex Systems:
    - a. Semi-Gloss Finish:
      - 1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: [www.sherwin-williams.com](http://www.sherwin-williams.com).
      - a) 4 mils wet, 1.5 mils dry per coat.
      - 2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series: [www.sherwin-williams.com](http://www.sherwin-williams.com).
      - a) 4 mils wet, 1.5 mils dry per coat.
    - b. Eg-Shel Finish:
      - 1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: [www.sherwin-williams.com/#sle](http://www.sherwin-williams.com/#sle).
      - a) 4 mils wet, 1.5 mils dry per coat.
      - 2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Eg-Shel, B20-2600 Series: [www.sherwin-williams.com/#sle](http://www.sherwin-williams.com/#sle).

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

### **3.02 PREPARATION**

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove mildew from impervious surfaces by scrubbing with solution of water and bleach. Rinse with clean water and allow surface to dry.
- D. Gypsum Board: Fill minor defects with filler compound; sand smooth and remove dust prior to painting.
- E. Ferrous Metal:
  - 1. Solvent clean according to SSPC-SP 1.
  - 2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Prime bare steel surfaces.
  - 3. Remove rust, loose mill scale, and other foreign substances using methods recommended by paint manufacturer and blast cleaning according to SSPC-SP 6. Protect from corrosion until coated.
- F. Wood: Remove dust, grit, and foreign matter. Scrape, sand, and spot prime knots and pitch streaks. Fill nail holes and imperfections with wood filler and sand smooth. This is not meant for the exterior "sough-sawn" wood.

### **3.03 APPLICATION**

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Apply products in accordance with manufacturer's written instructions.
- C. Apply coatings at spread rate required to achieve manufacturer's recommended dry film thickness.
- D. Regardless of number of coats specified, apply additional coats until complete hide is achieved.

### **3.04 PRIMING**

- A. Apply primer to all surfaces unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.
- B. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to top coat manufacturers.

### **3.05 CLEANING**

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.
- B. Clean surfaces immediately of overspray, splatter, and excess material.
- C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

### **3.06 PROTECTION**

- A. Protect finished coatings from damage until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

**END OF SECTION**

**SECTION 10 21 13.16  
PLASTIC-LAMINATE-CLAD TOILET COMPARTMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Plastic laminate toilet compartments.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 10 00 - Rough Carpentry: Blocking and supports.
- B. Section 10 28 00 - Toilet, Bath, and Laundry Accessories.

**1.03 REFERENCE STANDARDS**

- A. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceiling.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
- C. Product Data: Provide data on panel construction, hardware, and accessories.
- D. Samples: Submit two samples of partition panels, 6 x 6 inch in size illustrating panel finish, color, and sheen.
- E. Manufacturer's Installation Instructions: Indicate special procedures.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Plastic Laminate Toilet Compartments:
  - 1. Acceptable Manufacturer: Ironwood Manufacturing; 6405A 172<sup>nd</sup> St NE, Arlington, WA 98223-7744. Phone: (360) 568-1823. Web Site: [www.ironwood-mfg.com](http://www.ironwood-mfg.com). E-mail: [sales@ironwood-mfg.com](mailto:sales@ironwood-mfg.com).
  - 2. Substitutions: Section 01 60 00 - Product Requirements.

**2.02 COMPONENTS**

- A. Toilet Compartments - All Gender Model: Compact laminate finished, floor-mounted headrail-braced.
  - 1. Toilet Compartment Style:
    - a. All Gender - Headrail Braced
  - 2. Thickness:
    - a. Panels: 1/2 inch nominal.
    - b. Pilasters and Doors: 3/4 inch nominal.

3. Color:
    - a. To be selected from the full range.
  4. Edges:
    - a. Matching HeH banding
  5. Toilet Compartment All Gender Style:
    - a. Headrail braced mounting style,
    - b. Oversized panels and doors.
    - c. Zero Sightline Transom.
    - d. Zero Sightline door.
- B. Stile Pedestals: Clear anodized, aluminum pedestal, mounted to floor with Delron mounting disk, adjustable to meet uneven floor conditions, and thru bolted to stile with no less than two sex type fasteners. Pedestal shall be a min of 3" tall.
- C. Brackets/Hardware:
  1. Continuous stainless steel conforming to ASTM A-167, type 304 with a number 4 satin (brushed) finish.
- D. Anchorages and Fasteners: Standard stainless-steel fasteners are furnished with theft-resistant type heads. All concealed steel fasteners shall be stainless steel.
- E. Hardware: Furnish hardware to comply with ANSI A117.1 and Title III of the Americans with Disabilities Act as follows:
  1. Hinges: Roton, continuous aluminum, geared hinge, concealed leaf. Model 780-110HD - 81.
  2. Closer: Hager 5100 with adjustable backcheck, sweep, and latching controls.
  3. Latch and Keeper: Occupancy indicator style, stainless steel.
  4. Coat hook: Formed stainless steel, type 304, surface mounted, with number 4 satin (brush) finish. Combination hook and bumper for in-swing doors, and individual coat hook, and button bumper for out-swing doors.
  5. Door Pull: Surface mounted, 8 inch bar type stainless steel with number 4 satin (brushed) finish.

## 2.03 FABRICATION

- A. General: Furnish standard doors, panels, screens, and stiles fabricated for a complete system.
- B. Slab style door: Unless otherwise indicated, furnish 24 inch wide and 84 inch tall in-swing doors for standard compartments and minimum 34 inch wide and 84 inch tall with 32 inch clear opening, out-swing doors for compartments to meet the requirements of the American with Disabilities Act (ADA).
- C. Zero Sightline Doors
  1. Strike edge of doors shall be rabbeted to match corresponding pilaster rabbet.
  2. Rabbeted door edges shall be finished with near matching PVC banding.
  3. Doors shall eliminate visual sight gap when in the closed position.
- D. Zero Stie Trasom shall be constructed to match door type in materials and finish and shall be mounted 3/4 inch above the door.
  1. Transom Type:
    - a. Compact laminate, matching door color and finish.
  2. Mounting:
    - a. Surface clip mounted to inside of stall.

- E. Panel: Unless otherwise indicated, panels of same finish and materials as other components with widths to meet requirements. Panel to be mounted 1" above finished floor.
- F. Pilaster:
  - 1. Furnish cut outs at bottom of pilaster matching pedestal profile to allow pilaster to mount within 1 inch of finished floor. Pilaster to be supported overhead using a 3-inch aluminum, anti-grip headrail.
  - 2. Strike edge of pilaster shall be rabbeted to receive corresponding door with rabbet.
  - 3. Rabbeted pilaster edges shall be HeH banded.
  - 4. Pilasters shall eliminate visual sight gap when door is in the closed position.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify that field measurements are as indicated on shop drawings.
- C. Verify correct spacing of and between plumbing fixtures.
- D. Verify correct location of built-in framing, anchorage, and bracing.

### **3.02 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### **3.03 INSTALLATION**

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
- B. Attach panel brackets securely to walls using anchor devices.
- C. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.
- D. Provide clearance of not more than 1/2 inch between pilasters and panels and not more than 3/4 inch between panels and walls. Secure
- E. Secure panel and stiles located to align with wall brackets.
- F. Secure panels in position with manufacturer's recommended anchoring devices.

### **3.04 ADJUSTING**

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
- B. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.
- C. Adjust adjacent components for consistency of line or plane.

## **END OF SECTION**

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

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Grab bars.
- B. Mirrors.
- C. Specialty accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 09 21 16 - Gypsum Board Assemblies: Placement of wood blocking, steel sheet blocking, and backing plates in stud wall construction for attachment of accessories.

**1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.
- C. Samples: Submit two samples of each accessory, indicating color and finish.
- D. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Basis of Design Manufacturer: Bobrick
- B. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 GRAB BARS**

- A. Grab Bars: Type 304 stainless steel.
  - 1. Standard Duty Grab Bars:
    - a. Push/Pull Point Load: 250 lbf, minimum.
    - b. OD: As indicated in product listing.
    - c. Tubing Thickness: 18 gauge, 0.05 inch.
    - d. Flange Mounting: As indicated in product listing.
    - e. Flange Thickness: 11 gauge, 0.125 inch
    - f. Clearance: 1-1/2 inch clearance between wall and inside of grab bar.
    - g. Length and Configuration: As indicated on drawings.
    - h. Finish: Satin-finish stainless steel
    - i. Products:
      - 1) B-6806 x18 -18 - 18 inch length - Grab Bar - Exposed Flange, 1-1/4 inch -OD, Peened - Straight Grab Bar.
      - 2) B-6806 x36-36 - 36 inch length - Exposed Flange, 1-1/4 inch OD, Peened - Straight Grab Bar.

- 3) B-6806 x42 -42 - 42 inch length - Snap Flange, 1-1/2 inch OD, Peened - Straight Grab Bar.

## **2.03 MIRRORS**

A. Mirrors: Stainless steel framed, 1/4 inch thick annealed float glass, ASTM C1036.

### 1. Products:

- a. B-165 Series - Channel-Frame Mirror.
  - 1) B-165-4836
- b. B-293 Series - Fixed Tilt Mirror.
  - 1) B-293-2436

## **2.04 OTHER ACCESSORIES - AS SCHEDULED ON DRAWINGS**

## **2.05 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.

## **2.06 FINISHES**

A. Stainless Steel: Satin finish, unless otherwise noted.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.
- C. Verify that field measurements are as indicated on drawings.
- D. See Section 06 10 00 for installation of blocking in walls.

### **3.02 INSTALLATION**

- A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.
- B. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.

### **3.03 PROTECTION**

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

**END OF SECTION**



**SECTION 10 28 14  
ELECTRIC HAND DRYERS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

A. Warm air, self-contained electric hand and hair dryers.

**1.02 RELATED SECTIONS**

A. Section 06 10 00 - Rough Carpentry: Blocking in stud partitions for mounting hand dryers.

**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. Operating protocol and performance.
3. Storage and handling requirements and recommendations.
4. Installation and maintenance methods.

**1.04 QUALITY ASSURANCE**

A. Manufacturer Qualifications: Company specializing in manufacturing electric hand dryers with 10 years minimum experience.

**1.05 WARRANTY**

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

B. Provide manufacturer's standard limited warranty for period specified.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

A. Acceptable Manufacturer: Excel Dryer, Inc., 357 Chestnut Street, P.O. Box 365, East Longmeadow, MA 01028. Tel: (413) 525-4531. Fax: (413) 525-2853. [www.exceldryer.com](http://www.exceldryer.com).

**2.02 ELECTRIC HAND DRYERS**

- A. Hand Dryer: Warm air, rapid drying electric hand dryer; XLERATOR (r) - Model AL-SB
1. Warranty Period: 3 years; limited warranty.
  2. Controls: Automatic, activated by infrared optical sensor. Operates while hands are under blower. Shut-off within 2 seconds when hands removed, or in 35 seconds if hands not removed.
  3. Cover: One piece, heavy duty, rust-resistant, rib-reinforced, die-cast zinc alloy.
  4. Finish: Bright chrome plated.
  5. Air Intake: Inlet openings on bottom of cover.
  6. Air Outlet: Delivers focused air stream at average hand position of 4 inches below air outlet.
  7. Wall Plate: Injection molded, rib reinforced plate with metal L brackets to attach cover, with ten 5/16 inch diameter holes for surface mounting to wall and three 7/8 inch diameter holes for electrical wiring; bottom hole suitable for surface conduit.

8. Nominal Size: 11-3/4 inches wide by 12-11/16 inches high by 6-11/16 inches deep. Weight: 16 pounds.
9. Power Source: 110/120 volt, 12.5 amp, 60 Hz.
10. Combination Motor and Blower: Series commutated, through-flow discharge, vacuum type; 5/8 HP, 20,000 RPM. Air flow rate: 16,000 linear feet per minute at air outlet, 14,000 linear feet per minute at average hand position of 4 inches below air outlet.
11. Heater: Nichrome wire element, mounted inside blower housing to be vandal proof.
12. Heater Safeguard: Automatic resetting thermostat to open when air flow is restricted and close when air flow is resumed.
13. Air Temperature: 135 degrees F measured at average hand position of 4 inches below air outlet. Air Heater Output: 900 watts.
14. All metal parts coated according to Underwriters Laboratories, Inc. requirements; UL labeled.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Clean surfaces thoroughly prior to installation with mild soap. Do not use abrasives.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Coordinate requirements for blocking to ensure adequate means for support and installation of hand dryers.
- D. Coordinate requirements for power supply, conduit, disconnect switches, and wiring.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install dryers securely to supporting substrate so that fixtures are level and aligned with each other. Use type and length of fastener as recommended by manufacturer for type of substrate.

### **3.03 PROTECTION**

- A. Inspect installation to verify secure and proper mounting. Test each dryer to verify operation, control functions, and performance. Correct deficiencies.
- B. Protect installed dryers until completion of project.
- C. Replace damaged units before Substantial Completion.

**END OF SECTION**

**SECTION 21 05 00  
COMMON WORK RESULTS FOR FIRE SUPPRESSION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Above ground piping.
- B. Escutcheons.
- C. Mechanical couplings.
- D. Pipe hangers and supports.
- E. Pipe sleeves.

**1.02 RELATED REQUIREMENTS**

- A. Section 21 13 00 - Fire-Suppression Sprinkler Systems: Sprinkler systems design.

**1.03 REFERENCE STANDARDS**

- A. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250; 2020.
- B. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2021.
- C. ASME B16.4 - Gray Iron Threaded Fittings: Classes 125 and 250; 2021.
- D. ASME B16.25 - Buttwelding Ends; 2022.
- E. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings; 1999, with Editorial Revision (2022).
- F. ASTM A536 - Standard Specification for Ductile Iron Castings; 1984, with Editorial Revision (2019).
- G. ASTM C592 - Standard Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type); 2022a.
- H. AWWA C606 - Grooved and Shouldered Joints; 2022.
- I. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- J. UL (DIR) - Online Certifications Directory; Current Edition.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturer's catalog information. Indicate valve data and ratings.
- C. Shop Drawings: Indicate pipe materials used, jointing methods, supports, and floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.
- D. Project Record Documents: Record actual locations of components and tag numbering.
- E. Operation and Maintenance Data: Include installation instructions and spare parts lists.

## **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified in this section.
  - 1. Minimum three years experience.
- C. Conform to UL and FM requirements.
- D. Valves: Bear UL and FM label or marking. Provide manufacturer's name and pressure rating marked on valve body.
- E. Products Requiring Electrical Connection: Listed and classified as suitable for the purpose specified and indicated.
- F. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

## **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver and store valves in shipping containers, with labeling in place.
- B. Provide temporary protective coating on cast iron and steel valves.
- C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

## **PART 2 PRODUCTS**

### **2.01 GENERAL REQUIREMENTS**

- A. Welding Materials and Procedures: Comply with ASME BPVC-IX.
- B. Provide system pipes, fittings, sleeves, escutcheons, seals, and other related accessories.

### **2.02 ABOVE GROUND PIPING**

- A. Steel Pipe: Schedule 40, black.
  - 1. Steel Fittings: ASME B16.9 wrought steel, buttwelded or ASME B16.25 buttweld ends.
  - 2. Cast Iron Fittings: ASME B16.1, flanges and flanged fittings and ASME B16.4, threaded fittings.
  - 3. Malleable Iron Fittings: ASME B16.3, threaded fittings and ASTM A47/A47M.
  - 4. Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe.
  - 5. Mechanical Formed Fittings: Carbon steel housing with integral pipe stop and O-ring pocked and O-ring, uniformly compressed into permanent mechanical engagement onto pipe.

### **2.03 PIPE SLEEVES**

- A. Plastic, Sheet Metal, or Moisture-Resistant Fiber: Pipe passing through interior walls, partitions, and floors, unless steel or brass sleeves are specified below.
- B. Clearances:

1. Provide allowance for insulated piping.
2. Wall, Floor, Floor, Partitions, and Beam Flanges: 1 inch greater than external; pipe diameter.

## **2.04 ESCUTCHEONS**

### **A. Manufacturers:**

1. Fire Protection Products, Inc.
2. Tyco Fire Protection Products.
3. Viking Group Inc.

### **B. Material:**

1. Fabricate from nonferrous metal.
2. Chrome-plated.
3. Metals and Finish: Comply with ASME A112.18.1.

### **C. Construction:**

1. One-piece for mounting on chrome-plated tubing or pipe and one-piece or split-pattern type elsewhere.
2. Internal spring tension devices or setscrews to maintain a fixed position against a surface.

## **2.05 PIPE HANGERS AND SUPPORTS**

- A. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.

## **2.06 MECHANICAL COUPLINGS**

### **A. Manufacturers:**

1. Anvil International.
2. Tyco Fire Protection Products.
3. Victaulic Company; FireLock Style 009H.

### **B. Rigid Mechanical Couplings for Grooved Joints:**

1. Dimensions and Testing: Comply with AWWA C606.
2. Minimum Working Pressure: 300 psig.
3. Housing Material: Fabricate of ductile iron complying with ASTM A536.
4. Housing Coating: Factory applied orange enamel.
5. Gasket Material: EPDM suitable for operating temperature range from minus 30 degrees F to 230 degrees F.
6. Bolts and Nuts: Hot-dipped-galvanized or zinc-electroplated steel.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

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

### 3.02 INSTALLATION

- A. Install sprinkler system and service main piping, hangers, and supports in accordance with NFPA 13.
- B. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- C. Install piping to conserve building space, to not interfere with use of space and other work.
- D. Group piping whenever practical at common elevations.
- E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- F. Pipe Hangers and Supports:
  - 1. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
  - 2. Place hangers within 12 inches of each horizontal elbow.
  - 3. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
- G. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
- H. Prepare pipe, fittings, supports, and accessories for finish painting. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc-rich primer to welding.
- I. Do not penetrate building structural members unless indicated.
- J. Provide sleeves when penetrating floors, walls, and partitions and seal pipe and sleeve penetrations to achieve fire resistance equivalent to fire separation required.
  - 1. Aboveground Piping:
    - a. Pack solid using mineral fiber complying with ASTM C592.
    - b. Fill space with an elastomer caulk to a depth of 0.50 inch where penetrations occur between conditioned and unconditioned spaces.
- K. Escutcheons:
  - 1. Install and firmly attach escutcheons at piping penetrations into finished spaces.
  - 2. Provide escutcheons on both sides of partitions separating finished areas through which piping passes.
  - 3. Attach plates at the underside only of suspended ceilings.
  - 4. Use chrome plated escutcheons in occupied spaces and to conceal openings in construction.
- L. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, unions, and couplings for servicing are consistently provided.

### 3.03 CLEANING

- A. Upon completion of work, clean all parts of the installation.

- B. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

**END OF SECTION**

**SECTION 21 13 00  
FIRE-SUPPRESSION SPRINKLER SYSTEMS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Wet-pipe sprinkler system.
- B. System design, installation, and certification.

**1.02 RELATED REQUIREMENTS**

- A. Section 21 05 00 - Common Work Results for Fire Suppression: Pipe and fittings.

**1.03 REFERENCE STANDARDS**

- A. FM (AG) - FM Approval Guide; Current Edition.
- B. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. UL (DIR) - Online Certifications Directory; Current Edition.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on sprinklers, valves, and specialties, including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.
- C. Shop Drawings:
  - 1. Indicate hydraulic calculations, detailed pipe layout, hangers and supports, sprinklers, components, and accessories. Indicate system controls.
  - 2. Submit shop drawings to Authorities Having Jurisdiction for approval. Submit proof of approval to Architect/Engineer.
- D. Operation and Maintenance Data: Include components of system, servicing requirements, record drawings, inspection data, replacement part numbers and availability, and location and numbers of service depot.
- 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.
  - 2. Extra Sprinklers: Type and size matching those installed in quantity required by referenced NFPA design and installation standard.
  - 3. Sprinkler Wrenches: For each sprinkler type.
- F. Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations.

**1.05 QUALITY ASSURANCE**

- A. Conform to FM (AG) requirements.



- B. Designer Qualifications: Design system under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located. Or a holder of a valid NICET level III or IV Sprinkler Technician.
- C. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- D. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years experience approved by manufacturer.
- E. Equipment and Components: Provide products that bear FM (AG) label or marking.
- F. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.

## **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

## **PART 2 PRODUCTS**

### **2.01 SPRINKLER SYSTEM**

- A. Sprinkler System: Provide coverage for building areas noted.
- B. Occupancy: Light hazard; comply with NFPA 13.
- C. Water Supply: Determine volume and pressure from water flow test data.
- D. Storage Cabinet for Spare Sprinklers and Tools: Steel, located adjacent to alarm valve.

### **2.02 SPRINKLERS**

- A. Suspended Ceiling Type: Concealed pendant type with matching push on escutcheon plate.
  - 1. Response Type: Quick.
  - 2. Coverage Type: Standard.
  - 3. Finish: Enamel, color white .
  - 4. Escutcheon Plate Finish: Enamel, color white.
  - 5. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- B. Exposed Area Type: Upright type with guard.
  - 1. Response Type: Quick.
  - 2. Coverage Type: Standard.
  - 3. Finish: Brass.
  - 4. Fusible Link: Glass bulb type temperature rated for specific area hazard.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install in accordance with referenced NFPA design and installation standard.
- B. Install equipment in accordance with manufacturer's instructions.

- C. Place pipe runs to minimize obstruction to other work.
- D. Place piping in concealed spaces above finished ceilings.
- E. Center sprinklers in two directions in ceiling tile and provide piping offsets as required.
- F. Apply masking tape or paper cover to ensure concealed sprinklers, cover plates, and sprinkler escutcheons do not receive field paint finish. Remove after painting. Replace painted sprinklers.
- G. Flush entire piping system of foreign matter.
- H. Hydrostatically test entire system.
- I. Require test be witnessed by Authority Having Jurisdiction.

### **3.02 INTERFACE WITH OTHER PRODUCTS**

- A. Ensure required devices are installed and connected as required to fire alarm system.

### **3.03 SCHEDULES**

- A. System Hazard Areas:
  - 1. Offices: Light Hazard.
  - 2. Equipment and Storage Rooms: Ordinary Hazard, Group 2.
  - 3. Other Areas: In accordance with NFPA 13.

**END OF SECTION**

**SECTION 22 05 53**  
**IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Tags.
- B. Pipe markers.

**1.02 REFERENCE STANDARDS**

- A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2023.

**PART 2 PRODUCTS**

**2.01 PLUMBING COMPONENT IDENTIFICATION GUIDELINE**

- A. Tags:
  - 1. Piping: 3/4 inch diameter and smaller.
  - 2. Manual operated and automated control valves.
- B. Pipe Markers: 3/4 inch diameter and higher.

**2.02 TAGS**

- A. Manufacturers:
  - 1. Brimar Industries, Inc.
  - 2. Craftmark Pipe Markers.
  - 3. Kolbi Pipe Marker Co.
  - 4. Seton Identification Products.
- B. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch diameter.
- C. Valve Tag Chart: Typewritten 12-point letter size list in anodized aluminum frame.

**2.03 PIPE MARKERS**

- A. Manufacturers:
  - 1. Brimar Industries, Inc.
  - 2. Craftmark Pipe Markers.
  - 3. Kolbi Pipe Marker Co.
  - 4. Seton Identification Products.
- B. Comply with ASME A13.1.
- C. Flexible Tape Marker: Flexible, vinyl film tape with pressure-sensitive adhesive backing and printed markings.
- D. Identification Scheme, ASME A13.1:
  - 1. Primary: External Pipe Diameter, Uninsulated or Insulated.
    - a. 3/4 to 1-1/4 inches: Use 8 inch field-length with 1/2 inch text height.
    - b. 1-1/2 to 2 inches: Use 8 inch field-length with 3/4 inch text height.

- c. 2-1/2 to 6 inches: Use 12 inch field-length with 1-1/4 inch text height.
2. Secondary: Color scheme per fluid service.
  - a. Water; Potable, Cooling, Boiler Feed, and Other: White text on green background.
3. Tertiary: Other Details.
  - a. Directional flow arrow.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Degrease and clean surfaces to receive identification products.

### **3.02 INSTALLATION**

- A. Install flexible nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- B. Install plastic pipe markers in accordance with manufacturer's instructions.
- C. Install plastic tape pipe marker around pipe in accordance with manufacturer's instructions.
- D. Apply ASME A13.1 Pipe Marking Rules:
  1. Place pipe marker adjacent to changes in direction.
  2. Place pipe marker adjacent each valve port and flange end.
  3. Place pipe marker at both sides of floor and wall penetrations.
  4. Place pipe marker every 25 to 50 feet interval of straight run.

**END OF SECTION**

**SECTION 22 07 19  
PLUMBING PIPING INSULATION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Glass fiber insulation.
- B. Jacketing and accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 84 00 - Firestopping.
- B. Section 22 10 05 - Plumbing Piping: Placement of hangers and hanger 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 C547 - Standard Specification for Mineral Fiber Pipe Insulation; 2022a.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
- E. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2022a, with Editorial Revision (2023).
- F. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

**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. Applicator Qualifications: Company specializing in performing the type of work specified in this section with minimum three years of experience.
- B. Comply with the Midwest Insulation Contractors Association "National Commercial and Industrial Insulation Standards".

**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, UL 723, ASTM E84, or UL 723.

### **2.02 GLASS FIBER INSULATION**

- A. Manufacturers:
  - 1. CertainTeed Corporation.
  - 2. Johns Manville Corporation.
  - 3. Knauf Insulation.
  - 4. Owens Corning Corporation.
- B. Insulation: ASTM C547 and ASTM C795; semi-rigid, noncombustible, end grain adhered to jacket.
  - 1. K Value: ASTM C177, 0.24 at 75 degrees F.
  - 2. Maximum Service Temperature: 650 degrees F.
  - 3. Maximum Moisture Absorption: 0.2 percent by volume.
- C. Vapor Barrier Jacket: White Kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm.
- D. Vapor Barrier Lap Adhesive: Compatible with insulation.
- E. Insulating Cement/Mastic: ASTM C195; hydraulic setting on mineral wool.

### **2.03 JACKETING AND ACCESSORIES**

- A. PVC Plastic Jacket:
  - 1. Jacket: One piece molded type fitting covers and sheet material, off-white color.
    - a. Minimum Service Temperature: 0 degrees F.
    - b. Maximum Service Temperature: 150 degrees F.
    - c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
    - d. Thickness: 10 mil, 0.010 inch.
    - e. Connections: Brush on welding adhesive.
  - 2. Covering Adhesive Mastic: Compatible with insulation.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

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

### **3.02 INSTALLATION**

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

- B. 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. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints. All hangers, supports, anchors and other projections that are in contact to cold surfaces shall be insulated and vapor sealed to prevent condensation.
- E. Glass fiber insulated pipes conveying fluids below ambient temperature:
  - 1. Provide vapor barrier jackets, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure-sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
  - 2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.
- F. For hot piping conveying fluids 140 degrees F or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.
- G. 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.
- H. Inserts and Shields:
  - 1. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
  - 2. Insert Location: Between support shield and piping and under the finish jacket.
  - 3. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
  - 4. Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.
- I. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions.
- J. Apply insulation at pipe hangers and supports according to National Commercial and Industrial Standards Plate Numbers 5, 6 and 7.

### **3.03 SCHEDULES**

- A. Plumbing Systems:
  - 1. Domestic Hot Water Supply:
    - a. Glass Fiber Insulation:
      - 1) Pipe Size Range: Up to and including 1-1/4 inch.
      - a) Thickness: 1 inch.
  - 2. Domestic Hot Water Recirculation:
    - a. Glass Fiber Insulation:
      - 1) Pipe Size Range: All sizes.

- a) Thickness: 1 inch.
- 3. Domestic Cold Water:
  - a. Glass Fiber Insulation:
    - 1) Pipe Size Range: All sizes.
      - a) Thickness: 1 inch.

**END OF SECTION**



**SECTION 22 10 05  
PLUMBING PIPING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Sanitary waste piping, above grade.
- B. Domestic water piping, above grade.
- C. Pipe flanges, unions, and couplings.
- D. Pipe hangers and supports.
- E. Valves
  - 1. Ball valves.
  - 2. Strainers.
- F. Piping Specialties
  - 1. Flow control valves.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 84 00 - Firestopping.
- B. Section 22 05 53 - Identification for Plumbing Piping and Equipment.
- C. Section 22 07 19 - Plumbing Piping Insulation.

**1.03 REFERENCE STANDARDS**

- A. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2021.
- B. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2021.
- C. ASME B16.23 - Cast Copper Alloy Solder Joint Drainage Fittings: DWV; 2021.
- D. ASME B16.29 - Wrought Copper and Wrought Copper Alloy Solder-Joint Drainage Fittings—DWV; 2022.
- E. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings; 2021.
- F. ASTM B32 - Standard Specification for Solder Metal; 2020.
- G. ASTM B306 - Standard Specification for Copper Drainage Tube (DWV); 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 C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings; 2020a.
- K. ASTM C1277 - Standard Specification for Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings; 2020.

- L. ASTM C1540 - Standard Specification for Heavy-Duty Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings; 2020.
- M. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2020.
- N. ASTM D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings; 2020.
- O. 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.
- P. AWWA C651 - Disinfecting Water Mains; 2014, with Addendum (2020).
- Q. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; 2021.
- R. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; 2020.
- S. FM 1680 - Approval Standard for Couplings Used in Hubless Cast Iron Systems for Drain, Waste or Vent, Sewer, Rainwater or Storm Drain Systems Above and Below Ground, Industrial/ Commercial and Residential; 1989.
- T. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2018, with Amendment (2019).
- U. NSF 61 - Drinking Water System Components - Health Effects; 2022, with Errata.
- V. NSF 372 - Drinking Water System Components - Lead Content; 2022.
- W. Safe Drinking Water Act, Section 1417 - Lead Free: Refers to the wetted surface of pipe, fittings and fixtures in potable water systems that have a weighted average lead content  $\leq 0.25\%$ , Amended January 4, 2011.

#### **1.04 QUALITY ASSURANCE**

- A. Perform work in accordance with applicable codes.
- B. Valves: Manufacturer's name and pressure rating marked on valve body. Manufacturers lead free marking on valve body.
- C. Perform Work in accordance with City plumbing ordinances.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

## **PART 2 PRODUCTS**

### **2.01 GENERAL REQUIREMENTS**

- A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

### **2.02 SANITARY WASTE PIPING, ABOVE GRADE**

- A. Cast Iron Pipe: ASTM A74, service weight.
  - 1. Fittings: Cast iron.
  - 2. Joint Seals: ASTM C564 neoprene gaskets, or lead and oakum.
- B. Cast Iron Pipe: CISPI 301, hubless, service weight.
  - 1. Fittings: Cast iron.
  - 2. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield assemblies.
- C. Copper Tube: ASTM B306, DWV.
  - 1. Fittings: ASME B16.29, wrought copper, or ASME B16.23, solvent.
  - 2. Joints: ASTM B32, alloy Sn50 solder.
- D. PVC Pipe: ASTM D2665.
  - 1. Fittings: PVC.
  - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

### **2.03 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 for 2" and under.
  - 3. Joints: AWS A5.8M/A5.8, BCuP copper/silver braze for 2-1/2" and over.
  - 4. Mechanical Press Sealed Fittings: Double pressed type, NSF 61 approved or certified, utilizing EPDM, non toxic synthetic rubber sealing elements. Sealing elements shall be factory installed by fitting manufacturer. Press ends shall have means to indicate non-pressed fitting during pressure testing.
    - a. Manufacturers:
      - 1) Viega LLC.
      - 2) Nibco.

### **2.04 PIPE FLANGES, UNIONS, AND COUPLINGS**

- A. Unions for Pipe Sizes 3 inch and Under:
  - 1. Ferrous Pipe: Class 150 malleable iron threaded unions.
  - 2. Copper Tube and Pipe: Class 150 bronze unions with soldered joints.
- B. Flanges for Pipe Sizes Over 1 inch:
  - 1. Ferrous Pipe: Class 150 malleable iron threaded or forged steel slip-on flanges; preformed neoprene gaskets.
  - 2. Copper Tube and Pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.
- C. No-Hub Couplings:
  - 1. Testing: In accordance with ASTM C1277 and CISPI 310.
  - 2. Gasket Material: Neoprene complying with ASTM C564.

3. Band Material: Stainless steel.
  4. Eyelet Material: Stainless steel.
- D. Shielded, Heavy Duty No-Hub Couplings:
1. Testing: In accordance with ASTM C1540 and FM 1680.
  2. Gasket Material: Neoprene complying with ASTM C564.
  3. Band Material: Stainless steel.
  4. Eyelet Material: Stainless steel.
- E. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

## 2.05 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 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
  2. Hangers for Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.
  3. Wall Support for Pipe Sizes to 3 inch: Cast iron hook.
  4. Wall Support for Pipe Sizes 4 inch and Over: Welded steel bracket and wrought steel clamp.
  5. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
  6. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- C. Plumbing Piping - Water:
1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
  2. Hangers for Cold Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.
  3. Wall Support for Pipe Sizes Up to 3 inch: Cast iron hook.
  4. Wall Support for Pipe Sizes 4 inch and Larger: Welded steel bracket and wrought steel clamp.
  5. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
  6. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
  7. Strut mounted pipe shall have clamps with insert for pipe support to allow for continuous insulation at clamp. Manufacturer; Klo-Shure insulation couplings

## 2.06 BALL VALVES

- A. Manufacturers:
1. Nibco, Inc; T/S-585-66-LF.
  2. Apollo Valves.
  3. Watts.
- B. Construction, 4 Inches and Smaller: MSS SP-110, Class 150, 400 psi CWP, bronze body, 304 stainless steel ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle, solder, threaded, or grooved ends.

## 2.07 PIPING SPECIALTIES

### A. Flow Controls:

1. Manufacturers:
  - a. ThermOmegaTech; Circuit Solver, Model CS-1/2-120
  - b. Substitutions: See Section 01 60 00 - Product Requirements.
2. Flow control assembly with self-acting thermostatic recirculation valve which automatically and continuously maintains potable hot water supply at the specified water temperature. As the water temperature increases the valve shall proportionally close dynamically adjusting flow regardless of system operating pressure.
3. Construction: Major components constructed of type 303 SS, all lead free components, thermal actuator shall be spring loaded and self-cleaning. Rated to 200 psig maximum working pressure and 250 degrees F maximum working temperature.
4. Components: Assembly consisting of thermal actuator, check valve, and isolation ball valves on both ends.

## 2.08 SWING CHECK VALVES

### A. Manufacturers:

1. Nibco, Inc; S-413-Y-LF.
2. Milwaukee Valve Company.
3. Watts.

### B. Up to 2 Inches:

1. MSS SP-139, 300 CWP, silicon bronze (ASTM Listed and corrosion resistant) body and cap designed for horizontal or vertical (flow in upward direction) flow, PTFE or TFE swing disc with rubber seat, solder ends.

## 2.09 STRAINERS

### A. Size 1/2 inch to 3 inch:

1. Class 150, threaded forged bronze Y-pattern body, stainless steel perforated mesh screen with cap, and rated for 150 psi, 250 deg F WOG service.

### B. Size 1-1/2 inch to 4 inch:

1. Class 125, flanged iron body, Y pattern with 1/16 inch stainless steel perforated screen.

## 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.
- D. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.

### 3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Plastic pipe to non-plastic pipe joints shall be made with; Caulked lead joints with caulked adapters, No-hub soil pipe shielded couplings with approved adaptor having a raised bead, Compression type joints for hub and spigot cast iron pipe, or Threaded adapters.
- D. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- E. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- F. Group piping whenever practical at common elevations.
- 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.
- I. Provide support for utility meters in accordance with requirements of utility companies.
- J. Prepare exposed, unfinished pipe, fittings, supports, and accessories for finish painting.
- K. Install bell and spigot pipe with bell end upstream.
- L. Install valves with stems upright or horizontal, not inverted.
- M. 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.
- N. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.
- O. Sleeve pipes passing through partitions, walls, and floors.
- P. Pipe Hangers and Supports:
  - 1. Support horizontal piping as indicated.
  - 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 floor. Support riser piping independently of connected horizontal piping.
  - 6. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
  - 7. Provide copper plated hangers and supports for copper piping.
  - 8. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
  - 9. Support cast iron drainage piping at every joint.

### 3.04 APPLICATION

- A. Install unions downstream of valves and at equipment or apparatus connections.
- B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.
- C. Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- D. Provide flow controls in water recirculating systems where indicated.

### 3.05 TOLERANCES

- A. Drainage Piping: Establish invert elevations within 1/2 inch vertically of location indicated and slope to drain at minimum of 1/8 inch per foot slope.
- B. Water Piping: Slope at minimum of 1/32 inch per foot and arrange to drain at low points.

### 3.06 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Prior to starting work, verify system is complete, flushed, and clean.
- B. Ensure acidity (pH) of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
- C. Inject disinfectant, free chlorine in liquid, powder, tablet, or gas form throughout system to obtain 50 to 80 mg/L residual.
- D. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
- E. Maintain disinfectant in system for 24 hours.
- F. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
- G. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
- H. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

### 3.07 SCHEDULES

- A. Pipe Hanger Spacing:
  - 1. Metal Piping:
    - a. Pipe Size: 1/2 inch to 1-1/4 inch:
      - 1) Maximum Hanger Spacing: 6.5 ft.
      - 2) Hanger Rod Diameter: 3/8 inches.
    - b. Pipe Size: 1-1/2 inch to 2 inch:
      - 1) Maximum Hanger Spacing: 10 ft.
      - 2) Hanger Rod Diameter: 3/8 inch.
    - c. Pipe Size: 2-1/2 inch to 3 inch:
      - 1) Maximum Hanger Spacing: 10 ft.
      - 2) Hanger Rod Diameter: 1/2 inch.
    - d. Pipe Size: 4 inch to 6 inch:
      - 1) Maximum Hanger Spacing: 10 ft.
      - 2) Hanger Rod Diameter: 5/8 inch.

2. Plastic Piping:
  - a. All Sizes:
    - 1) Maximum Hanger Spacing: 6 ft.
    - 2) Hanger Rod Diameter: 3/8 inch.

**END OF SECTION**



**SECTION 22 10 06  
PLUMBING PIPING SPECIALTIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Drains.
- B. Cleanouts.
- C. Hydrants.
- D. Backflow preventers with flood protection.
- E. Water hammer arrestors.
- F. Air vents.

**1.02 RELATED REQUIREMENTS**

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

**1.03 REFERENCE STANDARDS**

- A. ASME A112.6.3 - Floor Drains; 2022.
- B. ASSE 1012 - Performance Requirements for Backflow Preventers with an Intermediate Atmospheric Vent; 2021.
- C. ASSE 1013 - Performance Requirements for Reduced Pressure Principle Backflow Prevention Assemblies; 2021.
- D. ASSE 1019 - Performance Requirements for Wall Hydrant with Backflow Protection and Freeze Resistance; 2011 (Reaffirmed 2016).
- E. NSF 61 - Drinking Water System Components - Health Effects; 2022, with Errata.
- F. NSF 372 - Drinking Water System Components - Lead Content; 2022.
- G. PDI-WH 201 - Water Hammer Arresters; 2017.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
- C. Manufacturer's Instructions: Indicate Manufacturer's Installation Instructions: Indicate assembly and support requirements.
- D. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.
- E. Project Record Documents: Record actual locations of equipment, cleanouts, backflow preventers, water hammer arrestors.
- 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: One.

### **1.05 QUALITY ASSURANCE**

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

### **1.06 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.
  2. Zurn Industries, Inc.
  3. MIFAB.
- B. Floor Drain FD:
  1. ASME A112.6.3; lacquered cast iron two piece body with double drainage flange, weep holes, reversible clamping collar, and 6 inch round, adjustable nickel-bronze strainer.
  2. J.R. Smith Model 2005-A06NNB.

### **2.03 CLEANOUTS**

- A. Manufacturers:
  1. Jay R. Smith Manufacturing Company.
  2. Zurn Industries, Inc.
  3. MIFAB.
- B. Cleanouts at Interior Finished Floor Areas FCO:
  1. Lacquered cast iron body with anchor flange, threaded scoriated secured nickel bronze top, and ABS gasketed plug.
  2. J.R. Smith Model 4020-NB.
- C. Cleanouts at Interior Finished Wall Areas:
  1. Line type with lacquered cast iron body and round taper threaded bronze plug, and round stainless steel access cover secured with machine screw.
  2. J.R. Smith Model 4422.
- D. Cleanouts at Interior Unfinished Accessible Areas: Calked or threaded type. Provide bolted stack cleanouts on vertical rainwater leaders.
  1. J.R. Smith Model 4510.

## 2.04 HYDRANTS

### A. Manufacturers:

1. Jay R. Smith Manufacturing Company.
2. Zurn Industries, Inc.
3. Woodford.

### B. Wall Hydrants (H-1):

1. ASSE 1019; freeze resistant, self-draining type with stainless steel wall plate wall plate, enclosed in a flush mounted wall box hose thread spout, lockshield and removable key, and integral vacuum breaker.
2. J.R. Smith Model 5509-QT.
3. Woodford.
4. Zurn; Model Z1320.

## 2.05 BACKFLOW PREVENTERS

### A. Manufacturers:

1. Watts Regulator Company; Model Series PVS-7000.

### B. Flood Protection Backflow System (RPZBP):

1. ASSE 1013 and NSF 61 compliant stainless steel body assembly with corrosion resistant internal parts, stainless steel springs, diaphragm type differential pressure relief valve located between check valves, third check valve that opens under back pressure in case of diaphragm failure, and non-threaded vent outlet.
2. Configured to protect against backsiphonage and backpressure into potable water supply.
3. Size: 3 inch assembly with flanged OS&Y gate valves.
4. Maximum Working Parameters: 175 psi at 140 degrees F.
5. Accessories: Provide flanged Y-strainer, test cock, and shut-off automatic control valve and SentryPlus Alert system..
6. The Reduced Pressure Zone Assembly shall consist of two independent torsion spring check modules, a differential pressure relief valve located between and below the two modules, two drip tight shutoff valves, and required torsion spring check modules and relief valve shall be contained with a sleeve accessible single housing constructed from 304 (Schedule 40) stainless steel pipe with groove end connections. Torsion spring checks shall have replaceable elastomer discs and in operation produce drip tight closure against the reverse flow of liquid caused by backpressure or backsiphonage. Assembly shall be a Watts Series 957.
7. The Flood Protection Shutdown Valve (Watts LFF113FP) shall be a normally open Diaphragm Valve installed upstream of the Reduced Pressure Zone (RPZ) Backflow Assembly, and automatically close if the RPZ relief valve begins to discharge. A Time Delay supplied in the Control Box shall prevent the valve from closing on intermittent discharges from the RPZ relief valve. Once closed the ACV must be manually reset. The Relay Box on ACV connects to SentryPlus Alert™ Control Box, which is also connected to the Cellular Gateway for wireless communication alerting the user via text, phone, or email. This communication is via cellular network using Watts Syncta Cloud IoT platform. Control box is a remote mounted, 120VAC powered unit. Cellular Gateway is a remote mounted unit and can be mounted up to 100ft away from the Control Box. Extra set of Remote Trip Indication terminals on the Control Box allow

users to get remote alarms at their Building Management System (BMS) / PLC controller in the Control Room. The entire Valve station assembly shall be provided by the same manufacturer and be covered by a single warranty policy.

8. Operation:
  - a. The Watts smart and connected Engineered Flood Protection Valve Station with SentryPlus Alert™ helps protect against catastrophic property damage that can occur due to Relief Valve discharge and/or a blocked/undersized floor drain during normal relief valve operation. Typical conditions which can cause continuous relief valve discharge are:
    - 1) Fouled First Check Seat due to dirt, debris, or rocks
    - 2) Failed First Check Spring
    - 3) Clogged or blocked Relief Valve Sensing Line
    - 4) Relief Valve Diaphragm failure
  - b. The Watts LFF113FP Flood Protection Shutdown Valve is a normally open valve designed to be installed upstream of a Reduced Pressure Zone (RPZ) Backflow Prevention device. It is normally open and closes when continuous relief valve discharge through the drain pipe is sensed by the Flood Sensor, energizing the Relay Box and Solenoid Pilot.
  - c. The valve is equipped with a Solenoid By-Pass valve (normally closed) which manually closes the Main Valve when engaged. The Control Box is equipped with an adjustable time delay to avoid valve closure due to intermittent or nuisance relief valve discharge. The Position Indicator provides local, visual indication of valve closure and is useful during valve start-up and trouble- shooting. The valve remains closed and cannot re-open if flow stops or electrical service is interrupted, and must be manually reset after the RPZ is diagnosed and/or repaired.
  - d. The shutdown valve comes complete with the Relay Box, pre- wired Solenoid Valve, Manual Reset with Pressure Gauge, Position Indicator and Flood Sensor (field installed). The SentryPlus Alert™ Control Box and Cellular Gateway ship loose with 6 feet of interconnecting cable and must be field mounted.

## 2.06 WATER HAMMER ARRESTORS

### A. Manufacturers:

1. Jay R. Smith Manufacturing Company.
2. Oatey; Model Quiet Pipes.
3. Watts Regulator Company.
4. MIFAB.

### B. Water Hammer Arrestors:

1. Copper construction, piston 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. J.R. Smith; Model 5000 Series.

## 2.07 AIR VENTS

### A. Manufacturers:

1. ITT Bell & Gossett.
2. Taco, Inc.
3. Watts Regulator Company.

- B. Manual Type: Short vertical sections of 2 inch diameter pipe to form air chamber, with 1/8 inch brass needle valve at top of chamber.
- C. Float Type:
  - 1. Brass or semi-steel body, copper, polypropylene, or solid non-metallic float, stainless steel valve and valve seat; suitable for system operating temperature and pressure; with isolating valve.
  - 2. Cast iron body and cover, float, bronze pilot valve mechanism suitable for system operating temperature and pressure; with isolating valve.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.
- C. Install floor cleanouts at elevation to accommodate finished floor.
- D. Install approved potable water protection devices on plumbing lines where contamination of domestic water may occur; on boiler feed water lines, janitor rooms, fire sprinkler systems, premise isolation, irrigation systems, flush valves, interior and exterior hose bibbs.
- E. Pipe relief from backflow preventer to nearest drain.
- F. Install water hammer arrestors complete with accessible isolation valve on hot and cold water supply piping to plumbing fixtures.

**END OF SECTION**

**SECTION 22 30 00  
PLUMBING EQUIPMENT**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Diaphragm-type compression tanks.
- B. In-line circulator pumps.

**1.02 RELATED REQUIREMENTS**

- A. Section 26 05 83 - Wiring Connections: Electrical characteristics and wiring connections.

**1.03 REFERENCE STANDARDS**

- A. ASME BPVC-VIII-1 - Boiler and Pressure Vessel Code, Section VIII, Division 1: Rules for Construction of Pressure Vessels; 2023.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittals procedures.
- B. Product Data:
  - 1. Provide dimension drawings of water heaters indicating components and connections to other equipment and piping.
  - 2. Provide electrical characteristics and connection requirements.
- C. Operation and Maintenance Data: Include operation, maintenance, and inspection data, replacement part numbers and availability, and service depot location and telephone number.
- D. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.
- B. Certifications:
  - 1. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

**1.07 WARRANTY**

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

**PART 2 PRODUCTS**

**2.01 DIAPHRAGM-TYPE COMPRESSION TANKS**

- A. Manufacturers:
  - 1. Amtrol Inc; Model ST-5C-DD.

2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Construction: Deep drawn steel, tested and stamped in accordance with ASME BPVC-VIII-1; supplied with National Board Form U-1, rated for working pressure of 150 psig, with flexible heavy duty butyl, NSF/ANDI 61 diaphragm sealed into tank, antimicrobial polypropylene liner with anti-legionella protection, stainless steel system connection, and tubulator water circulator.

C. Accessories: Pressure gauge and air-charging fitting, .

## **2.02 IN-LINE CIRCULATOR PUMPS (HWRP)**

A. Manufacturers:

1. Armstrong Pumps Inc.
2. Bell & Gossett; Model Ecocirc 20-18.
3. Grundfos.

B. The pumps shall have a shaft-less, wet rotor design with a ceramic ball bearing lubricated by the system fluid, high efficiency type specifically designed for quiet operation. Variable speed circulator which modulates across the entire performance curve. Designed with highly efficient electronically commutated permanent magnet motor (ECM technology) for potable water systems.

C. Construction: Pump body shall be lead free bronze or stainless steel, EPDM o-ring, carbon/alumina ceramic bearing, nylon/PPO impeller and all other wetted parts stainless steel.

D. Pump shall have sensorless control to automatically adjust pump performance as required. Pump shall be capable of speed modulation across the full speed range.

E. Pump to be suitable for 203°F operation at 150 psi working pressure.

F. Pump to have three standard operating modes; Proportional Pressure, Constant Pressure and Constant Speed; the Automatic Air Purge and Standby.

1. Proportional pressure control mode shall automatically adjust the pump performance continuously to the requirements of the potable water systems based on the curve that is set with the adjustable dial.
2. Constant pressure control mode shall automatically maintain constant differential pressure at any flow rate, based on the curve that is set with the adjustable dial.
3. Constant speed maintain a fixed speed at any flow demand, based on the curve that is set with the adjustable dial.

G. Pump shall be supplied with a 1-inch integral check valve.

H. Motor shall be spherical electronically commutated motor, permanent magnet (ECM/PM). Motor shall be non-overloading at any point on the entire pump curve.

I. Performance:

1. As scheduled on the Drawings.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

A. Install plumbing equipment in accordance with manufacturer's instructions, as required by code, and complying with conditions required for applicable certifications.

- B. Electrical Work: Provide automatic control and protective devices with associated wiring to interconnect related interfaced devices required for specified operation.
- C. Coordinate with plumbing piping and related electrical work to achieve operating system.

**END OF SECTION**



**SECTION 22 40 00  
PLUMBING FIXTURES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Flush valve water closets.
- B. Lavatories.
- C. Bi-level, electric water coolers.

**1.02 RELATED REQUIREMENTS**

- A. Section 22 10 05 - Plumbing Piping.
- B. Section 22 10 06 - Plumbing Piping Specialties.

**1.03 REFERENCE STANDARDS**

- A. ASHRAE Std 18 - Methods of Testing for Rating Drinking-Water Coolers with Self-Contained Mechanical Refrigeration; 2008 (Reaffirmed 2013).
- B. ASME A112.6.1M - Floor-Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use; 1997 (Reaffirmed 2017).
- C. ASME A112.19.2 - Ceramic Plumbing Fixtures; 2018, with Errata.
- D. ASME A112.19.5 - Flush Valves and Spuds for Water Closets, Urinals, and Tanks; 2022.
- E. NSF 61 - Drinking Water System Components - Health Effects; 2022, with Errata.
- F. NSF 372 - Drinking Water System Components - Lead Content; 2022.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.
- C. Maintenance Data: Include fixture trim exploded view and replacement parts lists.
- D. 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.
- 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.

## 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 REGULATORY REQUIREMENTS

- A. Comply with applicable codes for installation of plumbing systems.

### 2.03 FLUSH VALVE WATER CLOSETS (WC-1), ADAAG COMPLIANT

#### A. Water Closets:

1. Vitreous china, ASME A112.19.2, wall hung, siphon jet flush action, china bolt caps.
2. Bowl: ASME A112.19.2; 16.5 inches high with elongated rim.
3. Flush Valve: Exposed (top spud).
4. Flush Volume: 1.6 gallon, maximum.
5. Flush Operation: Sensor operated. Dual flush.
6. Handle Height: 11 inches or less.
7. Inlet Size: 1-1/2 inches.
8. Trapway Outlet: 4 inch.
9. Color: White.
10. Manufacturers:
  - a. Sloan Valve Company; Model ST-2459.
  - b. American Standard, Inc.
  - c. Kohler Company.
  - d. Zurn industries, Inc

#### B. Flush Valves:

1. Valve Supply Size: 1 inch.
2. Valve Outlet Size: 1-1/2 inches.
3. Manufacturers:
  - a. Sloan Valve Company; Model 8111-1.6/1.1.
  - b. Zurn Industries, Inc.
  - c. Substitutions: See Section 01 60 00 - Product Requirements.
4. Sensor-Operated:
  - a. Type: ASME A112.19.5; chloramine-resistant clog-resistant dual-seat diaphragm valve complete with vacuum breaker, stops and accessories.
  - b. Mechanism: Battery powered, solenoid-operated piston or electronic motor-actuated operator with low-voltage powered infrared sensor, and mechanical override or override push button.

- c. Supplied Volume Dual Flush Capacity: 1.6/1.1 gal per flush.
- 5. Exposed Type: Chrome-plated, escutcheon, integral screwdriver stop.
- C. Toilet Seats:
  - 1. Manufacturers:
    - a. Bemis Manufacturing Company; Model 2155SSC.
    - b. Church Seat Company.
    - c. Olsonite.
  - 2. Plastic: Solid, antimicrobial, white finish, elongated shape, open front, self-sustaining hinge, and non-corrosive 300 Series stainless steel posts and pintles.
- D. Water Closet Carriers:
  - 1. Manufacturers:
    - a. Jay R. Smith Manufacturing Company; Model 211 Series.
    - b. Zurn Industries, Inc.
    - c. MIFAB.
  - 2. ASME A112.6.1M; adjustable cast iron frame, integral drain hub and vent, adjustable spud, lugs for floor and wall attachment, threaded fixture studs with nuts and washers.

## **2.04 FLUSH VALVE WATER CLOSETS (WC-2)**

- A. Water Closets:
  - 1. Vitreous china, ASME A112.19.2, wall hung, siphon jet flush action, china bolt caps.
  - 2. Bowl: ASME A112.19.2; 15 inches high with elongated rim.
  - 3. Flush Valve: Exposed (top spud).
  - 4. Flush Volume: 1.6 gallon, maximum.
  - 5. Flush Operation: Sensor operated. Dual flush.
  - 6. Handle Height: 11 inches or less.
  - 7. Inlet Size: 1-1/2 inches.
  - 8. Trapway Outlet: 4 inch.
  - 9. Color: White.
  - 10. Manufacturers:
    - a. Sloan Valve Company; Model ST-2459.
    - b. American Standard, Inc.
    - c. Kohler Company.
    - d. Zurn industries, Inc
- B. Flush Valves:
  - 1. Valve Supply Size: 1 inch.
  - 2. Valve Outlet Size: 1-1/2 inches.
  - 3. Manufacturers:
    - a. Sloan Valve Company; Model 8111-1.6/1.1.
    - b. Zurn Industries, Inc.
    - c. Substitutions: See Section 01 60 00 - Product Requirements.
  - 4. Sensor-Operated:

- a. Type: ASME A112.19.5; chloramine-resistant clog-resistant dual-seat diaphragm valve complete with vacuum breaker, stops and accessories.
  - b. Mechanism: Battery operated solenoid-operated piston or electronic motor-actuated operator with low-voltage powered infrared sensor, and mechanical override or override push button.
  - c. Supplied Volume Capacity: 1.6/1.1 gal per flush.
  - d. Metering: Provide wireless communications into monitoring and logging application.
  - 5. Exposed Type: Chrome-plated, escutcheon, integral screwdriver stop.
- C. Toilet Seats:
- 1. Manufacturers:
    - a. Bemis Manufacturing Company; Model 2155SSC.
    - b. Church Seat Company.
    - c. Olsonite.
  - 2. Plastic: Solid, antimicrobial, white finish, elongated shape, open front, self-sustaining hinge, and non-corrosive 300 Series stainless steel posts and pintles.
- D. Water Closet Carriers:
- 1. Manufacturers:
    - a. Jay R. Smith Manufacturing Company; Model 211 Series.
    - b. Zurn Industries, Inc.
    - c. MIFAB.
  - 2. ASME A112.6.1M; adjustable cast iron frame, integral drain hub and vent, adjustable spud, lugs for floor and wall attachment, threaded fixture studs with nuts and washers.

## **2.05 LAVATORIES (LAV(R)), ADAAG COMPLIANT**

- A. Manufacturers: Existing lavatory removed during demolition and being reinstalled in new location.
- 1. Kohler Company; Model Pinoir, K-2035-1.
- B. Sensor Operated Faucet:
- 1. Cast brass, chrome plated, deck mounted with infrared sensor located on neck of spout.
  - 2. Power Supply:
    - a. Battery: Replaceable alkaline or lithium type with 200,000 cycles, minimum.
  - 3. Mixing Valve: Thermostatic mixing valve, ASSE 1070 listed with combination stop, strainer and check valves. .
  - 4. Automatic Shut-off: 30 seconds.
  - 5. Sensor Range: Factory set at 4 inch adjustable up to 5 inch.
  - 6. Manufacturers:
    - a. Sloan Valve Company; EBF-615.
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Accessories:
- 1. Chrome-plated 17 gauge, 0.0538 inch brass P-trap and arm with escutcheon.
  - 2. Waste with perforated open strainer. Dearborn Brass.
  - 3. Wheel handle stops.
  - 4. Flexible supplies.

## **2.06 LAVATORIES (L-1), ADAAG COMPLIANT**

### **A. Manufacturers:**

1. Kohler Company; Model Pinoir, K-2035-1.
2. Substitutions: See Section 01 60 00 - Product Requirements.

### **B. Wall-Hung Basin:**

1. Vitreous China, Grade A: ASME A112.19.2; white oval commercial-grade sink with predrilled holes, rear-center drain, front overflow, and wall mount hanger. Size 22 by 18 inch with single faucet hole.
2. Provide with vitreous china sink shroud. Kohler model K-2057.

### **C. Sensor Operated Faucet:**

1. Cast brass, chrome plated, deck mounted with infrared sensor located on neck of spout.
2. Spout Style: Standard.
3. Power Supply:
  - a. Battery: Replaceable alkaline or lithium type with 200,000 cycles, minimum.
4. Mixing Valve: Thermostatic mixing valve, ASSE 1070 listed with combination stop, strainer and check valves. .
5. Water Supply: 3/8 inch compression connections.
6. Aerator: Vandal resistant, 0.5 gpm, laminar flow device.
7. Automatic Shut-off: 30 seconds.
8. Sensor Range: Factory set at 4 inch adjustable up to 5 inch.
9. Finish: Polished chrome.
10. Manufacturers:
  - a. Sloan Valve Company; EBF-615.
  - b. Substitutions: See Section 01 60 00 - Product Requirements.

### **D. Accessories:**

1. Chrome-plated 17 gauge, 0.0538 inch brass P-trap and arm with escutcheon.
2. Waste with perforated open strainer. Dearborn Brass.
3. Wheel handle stops.
4. Flexible supplies.

## **2.07 BI-LEVEL, ELECTRIC WATER COOLERS (EWC), ADAAG COMPLIANT**

### **A. Manufacturers:**

1. Elkay Manufacturing Company; EZTL8WSLK.
2. Haws Corporation.
3. Oasis International.

### **B. Water Cooler: Bi-level, electric, mechanically refrigerated; surface mounted, ADA compliant; 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.**

1. Capacity: 8 gph 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.

2. Electrical: 115 VAC, 60 Hertz compressor, 6 foot cord and plug for connection to electric wiring system including grounding connector.
- C. Bottle Filler: Materials to match fountain.
  1. Bottle Filling Unit: Unit shall mount on water cooler and include a bottle counter. Unit shall meet ADA Guidelines for parallel approach; include an electronic sensor for no-touch activation with an automatic 20-second shut-off time. Fill rate shall be 1.0 - 1.5 gpm laminar flow.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.
- B. Verify that electric power is available and of the correct characteristics.

### **3.02 PREPARATION**

- A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

### **3.03 INSTALLATION**

- A. Install each fixture with trap, easily removable for servicing and cleaning.
- B. Provide chrome-plated rigid or flexible supplies to fixtures with handwheel stops, reducers, and escutcheons.
- C. Install components level and plumb.
- D. Install and secure fixtures in place with wall supports and bolts.

### **3.04 ADJUSTING**

- A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

### **3.05 CLEANING**

- A. Clean plumbing fixtures and equipment.

**END OF SECTION**

**SECTION 23 31 00  
HVAC DUCTS AND CASINGS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Metal ducts.

**1.02 RELATED REQUIREMENTS**

- A. Section 23 37 00 - Air Outlets and Inlets.

**1.03 REFERENCE STANDARDS**

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
- D. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.
- E. NFPA 90B - Standard for the Installation of Warm Air Heating and Air-Conditioning Systems; 2024.
- F. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.
- G. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors; Current Edition, Including All Revisions.

**1.04 REGULATORY REQUIREMENTS**

- A. Construct ductwork to NFPA 90A standards.

**1.05 FIELD CONDITIONS**

- A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.
- B. Maintain temperatures within acceptable range during and after installation of duct sealants.

**PART 2 PRODUCTS**

**2.01 GENERAL REQUIREMENTS**

- A. Provide UL Class 1 ductwork, fittings, hangers, supports, and appurtenances in accordance with NFPA 90A and SMACNA (DCS) guidelines unless stated otherwise.
- B. Duct Shape and Material in accordance with Allowed Static Pressure Range:
  - 1. Round: Plus or minus 2 in-wc of galvanized steel.
  - 2. Rectangular: Plus or minus 1/2 in-wc of galvanized steel.
- C. Duct Sealing and Leakage in accordance with Static Pressure Class:
  - 1. Duct Pressure Class and Material for Common Mechanical Ventilation Applications:
    - a. Supply Air: 1/2 in-wc pressure class, galvanized steel.
    - b. Return and Relief Air: 1/2 in-wc pressure class, galvanized steel.

- c. General Exhaust Air: 1/2 in-wc pressure class, galvanized steel.
- 2. Low Pressure Service: Up to 2 in-wc:
  - a. Seal: Class C, apply to seal off transverse joints.
  - b. Leakage:
    - 1) Rectangular: Class 24 or 24 cfm/100 sq ft.
    - 2) Round: Class 12 or 12 cfm/100 sq ft.
- D. Duct Fabrication Requirements:
  - 1. Duct and Fitting Fabrication and Support: SMACNA (DCS) including specifics for continuously welded round and oval duct fittings.
  - 2. Use reinforced and sealed sheet-metal materials at recommended gauges for indicated operating pressures or pressure class.
  - 3. Construct tees, 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 airfoil turning vanes of perforated metal with glass fiber insulation.
  - 4. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
  - 5. 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.

## **2.02 METAL DUCTS**

- A. Material Requirements:
  - 1. Galvanized Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating.
- B. Round Metal Ducts:
  - 1. Round Single Wall Duct: Round lock seam duct with galvanized steel outer wall.
  - 2. Round Connection System: Interlocking duct connection system per SMACNA (DCS).
- C. Connectors, Fittings, Sealants, and Miscellaneous:
  - 1. Fittings: Manufacture with solid inner wall of perforated galvanized steel.
  - 2. Transverse Duct Connection System: SMACNA "E" rated rigid class connection, interlocking angle and duct edge connection system with sealant, gasket, cleats, and corner clips in accordance with SMACNA (DCS).
  - 3. Joint Sealers and Sealants: Non-hardening, water resistant, mildew and mold resistant.
    - a. 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.
    - b. VOC Content: Not more than 250 g/L, excluding water.
    - c. Surface Burning Characteristics: Flame spread index of zero and smoke developed index of zero, when tested in accordance with ASTM E84.
  - 4. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install, support, and seal ducts in accordance with SMACNA (DCS).



- B. Comply with safety standards NFPA 90A and NFPA 90B.
- C. During construction, provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering the ductwork system.
- D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
- E. Duct sizes indicated are precise inside dimensions. For lined ducts, maintain sizes inside lining.
- F. Duct sizes indicated shall be of sizes indicated. However, necessary changes in shape offsets or crossovers to clear piping, lighting, building construction obstructions, etc. shall be made without additional cost.
- G. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
- H. Use double nuts and lock washers on threaded rod supports.

**END OF SECTION**

**SECTION 23 34 23  
HVAC POWER VENTILATORS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Ceiling exhaust fans.

**1.02 RELATED REQUIREMENTS**

- A. Section 23 31 00 - HVAC Ducts and Casings.
- B. Section 26 05 83 - Wiring Connections: Electrical characteristics and wiring connections.

**1.03 REFERENCE STANDARDS**

- A. AMCA 99 - Standards Handbook; 2016.
- B. AMCA 204 - Balance Quality and Vibration Levels for Fans; 2020.
- C. AMCA 210 - Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating; 2016, with Errata (2018).
- D. AMCA 300 - Reverberant Room Method for Sound Testing of Fans; 2014.
- E. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data; 2022.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on fans and accessories, including fan curves with specified operating point plotted, power, rpm, sound power levels at rated capacity, and electrical characteristics and connection requirements.
- C. Maintenance Data: Include instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

**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 MANUFACTURERS**

- A. Greenheck.
- B. Loren Cook Company.
- C. Acme.

**2.02 POWER VENTILATORS - GENERAL**

- A. Static and Dynamically Balanced: Comply with AMCA 204.
- B. Performance Ratings: Comply with AMCA 210, bearing certified rating seal.

- C. Sound Ratings: Comply with AMCA 301, tested to AMCA 300, bearing certified sound ratings seal.
- D. Fabrication: Comply with AMCA 99.
- E. Electrical Components: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

## 2.03 CEILING EXHAUST FANS

- A. EF-1; Loren Cook Model GC-422.
  - 1. Construction: Forward curved galvanized steel fan wheel, corrosion resistant galvanized steel fan housing, acoustically insulated housing, aluminum backdraft damper with solid aluminum hinge rod mounted in brass bushings.
  - 2. Motor: Permanently lubricated motor with built-in thermal overload protection and disconnect plug.
  - 3. Accessories;
    - a. White aluminum grille.
    - b. Fan speed controller, prewired.
    - c. Integral backdraft damper.
    - d. Isolator Kit.
    - e. Wall cap, galvanized steel and 1/2" bird screen. Color to match exterior wall color. Cook Model WCG-2.
- B. EF-2; Loren Cook Model GC-146.
  - 1. Construction: The fan wheel housing and integral outlet duct shall be injection molded from a specially engineered resin exceeding UL requirements for smoke and heat generation. The outlet duct shall have provision for an aluminum backdraft damper with continuous aluminum hinge rod. The inlet box shall be minimum 22 gauge galvanized steel. Motor shall be isolation mounted to a one piece galvanized stamped steel integral motor mount/inlet. A field wiring compartment with disconnect receptacle shall be standard. To accommodate different ceiling thickness, an adjustable pre-punched mounting bracket shall be provided. Unit shall be designed with provision for field conversion from ceiling to in- line. Unit shall be shipped in ISTA Certified Transit Tested Packaging.
  - 2. Wheel: Wheel shall be centrifugal forward curved type, injection molded of polypropylene resin. Wheel shall be balanced in accordance with AMCA Standard 204-05, Balance Quality and Vibration Levels for Fans.
  - 3. Motor shall be open drip proof type with permanently lubricated bearings and include impedance or thermal overload protection and disconnect plug.
  - 4. Accessories;
    - a. White aluminum grille.
    - b. Fan speed controller, prewired.
    - c. Integral backdraft damper.
    - d. Isolator Kit.
    - e. Wall cap, galvanized steel and 1/2" bird screen. Color to match exterior wall color. Cook Model WCG-2

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Provide backdraft dampers on outlet from cabinet and ceiling exhausters fans and as indicated.

**END OF SECTION**

**SECTION 23 37 00  
AIR OUTLETS AND INLETS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Registers/grilles:
  - 1. Floor-mounted, supply register/grilles.
  - 2. Wall-mounted, exhaust and return register/grilles.

**1.02 REFERENCE STANDARDS**

- A. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.

**1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

**1.04 QUALITY ASSURANCE**

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

**PART 2 PRODUCTS**

**2.01 FLOOR SUPPLY REGISTERS/GRILLES**

- A. Manufacturers:
  - 1. Kees; Model Architectural Stamped Grille, Cloverleaf pattern..
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Type: Stamped grille with cloverleaf pattern.
- C. Frame: Minimum 1-1/4 inch margin over duct dimensions.
- D. Fabrication: Steel with 10 gauge face and frames with sleeve for additional stiffening and support and factory baked enamel finish.
- E. Color: Dark bronze.
- F. Damper: Opposed blade type attached to back of grille with removable key operator, operable from face.

**2.02 WALL RETURN REGISTERS/GRILLES**

- A. Manufacturers:
  - 1. Titus; Model 350RL.
  - 2. Nailor Industries; Model 6145H-O.
- B. Type: Streamlined blades, 3/4 inch minimum depth, 3/4 inch maximum spacing, vertical face.
- C. Frame: 1-1/4 inch margin with countersunk screw mounting.

D. Fabrication: Steel frames and blades, with factory baked enamel finish.

E. Color: To be selected by Architect/Engineer 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 inlets and make necessary adjustments in position to comply with architectural features, symmetry, and lighting arrangement.

C. Install diffusers to ductwork with air tight connection.

**END OF SECTION**

**SECTION 23 82 00**  
**CONVECTION HEATING AND COOLING UNITS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Electric baseboard heaters.

**1.02 RELATED REQUIREMENTS**

- A. Section 26 05 83 - Wiring Connections: Electrical characteristics and wiring connections.  
Installation of room thermostats. Electrical supply to units.

**1.03 REFERENCE STANDARDS**

- A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

**1.04 SUBMITTALS**

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

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

**PART 2 PRODUCTS**

**2.01 ELECTRIC BASEBOARD HEATERS**

- A. Manufacturers:
  - 1. Marley Engineered Products; BKOC Series.
  - 2. Vulcan Radiator, a Mestek Company.
  - 3. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Provide products listed, classified, and labeled by Underwriters Laboratories Inc. (UL), Intertek (ETL), or testing firm acceptable to authority having jurisdiction as suitable for purpose indicated.
- C. Heater Assembly:
  - 1. Type 1: Surface mounted on finished floor with lower front air intake and upper front air discharge.
- D. Assembly: Suitable for flush mounting on any floor surface with built-in controls, wire raceway, thermal safety cut-out, and electric terminal box.
- E. Heating Elements:
  - 1. Enclosed nickel chromium nickel chromium wire in steel or steel sheathing or tubing.
  - 2. Mechanically bonded, aluminum finned, heating elements.
  - 3. Heating element securely anchored and free-floating for noise free operation.
- F. Enclosure Requirements:

1. General: 24 gauge, 0.0239 inch steel, minimum. Typical for panels, end-caps, corners, joiner pieces, and other related items. Joints to snap together without fasteners.
2. Exterior Cover Construction: 0.048 inch steel, minimum. Typical for architecturally exposed sides, grilles, front panel, and top panels.
3. All joints to snap together without fasteners.
4. Service Access Panels: Impact resistant; factory configure for easy removal.

G. Finish:

1. Factory applied, painted finish.
2. Color: As selected by architect from standard color options.

H. Controls: Internal bi-metal element thermostat, factory wired.

I. Electrical Characteristics:

1. As scheduled on drawings.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that surfaces are suitable for installation.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's recommendations.
- B. Install equipment exposed to finished areas after walls and ceilings are finished and painted.
- C. Do not damage equipment or finishes.
- D. Baseboard Radiation:
1. Locate on outside walls.
  2. Install end caps where units butt against walls.
- E. Units with Electric Heating Elements:
1. Install as indicated including electrical devices furnished by manufacturer but not factory installed.
  2. Install wiring in accordance with the manufacturer's wiring diagram submittal and Section 26 05 83.

### **3.03 PROTECTION**

- A. Provide finished cabinet units with protective covers during the balance of construction.

**END OF SECTION**



**SECTION 26 05 00**  
**BASIC ELECTRICAL REQUIREMENTS**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.02 SECTION INCLUDES**

- A. Basic Electrical Requirements and materials specifically applicable to Division 26 Sections, in addition to Division 1 - General Requirements. Section includes:
  - 1. Electrical Identification.
  - 2. Minor Demolition.
  - 3. Conductors and Devices.
  - 4. Raceways and Boxes.

**1.03 REGULATORY REQUIREMENTS**

- A. Conform to NFPA 70 - National Electrical Code, latest edition with amendments as adopted by the Village of Oak Brook, IL.
- B. Install electrical Work in accordance with the NECA Standard of Installation.

**1.04 DELIVERY, STORAGE AND HANDLING**

- A. Store and protect all materials as specified under the provisions of Section 01 60 00 and as specified herein.
- B. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.
- C. Ship products to the job site in their original packaging. Receive and store products in a suitable manner to prevent damage or deterioration. Keep equipment upright at all times.
- D. Investigate the spaces through which equipment must pass to reach its final destination. Coordinate with the manufacturer to arrange delivery at the proper stage of construction and to provide shipping splits where necessary.

**1.05 PROJECT/SITE CONDITIONS**

- A. Install work in locations shown on Drawings, unless prevented by Project conditions. Drawings have omitted certain branch circuitry in areas for ease of reading. All branch circuitry is to be provided by Contractor.
- B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission from Architect/Engineer before proceeding as specified under modification procedures.

**1.06 QUALITY ASSURANCE**

- A. Provide Work as required for a complete and operational electrical installation.

- B. All products shall be designed, manufactured, and tested in accordance with industry standards. Standards, organizations, and their abbreviations as used hereafter, include the following:
  - 1. American National Standards Institute, Inc (ANSI).
  - 2. American Society for Testing and Materials (ASTM).
  - 3. National Electrical Manufacturers Association (NEMA).
  - 4. Underwriters Laboratories, Inc. (UL).
- C. Install all Work in accordance with the NECA Standard of Installation.

## **1.07 SUBMITTALS**

- A. Submit all requested items in Division 26 Sections under provisions of Section 01 30 00.

## **1.08 SUBSTITUTIONS**

- A. Substitutions will be considered only as allowed within the provisions of Section 01 60 00.

## **1.09 PROJECT RECORD DOCUMENTS**

- A. Cooperate and assist in the preparation of project record documents under the provisions of Section 01 78 00.

## **1.10 TRENCHING, FILL AND COMPACTION**

### **1.11 TEMPORARY UTILITIES**

- A. Provide temporary lighting and power necessary for building construction. Perform work in accordance with Section 01 51 00 requirements.

### **1.12 PROJECT MANAGEMENT AND COORDINATION**

- A. Proper project management and coordination is critical for a successful project. Manage and coordinate the Work with all other trades in accordance with Section 01 30 00 requirements. Reliance on the Drawings and Specifications only for exact project requirements is insufficient for proper coordination.

## **PART 2 PRODUCTS**

### **2.01 WIRING METHODS**

- A. All locations: Building wire in raceway.
- B. Use no wire smaller than 12 AWG for power and lighting circuits, and no smaller than 14 AWG for control wiring.
  - 1. Use 10 AWG conductor for 20 ampere, 120 volt branch circuit home runs longer than 100 feet.

### **2.02 WIRE AND CABLE**

- A. Manufacturers:
  - 1. Okonite.
  - 2. Southwire.
  - 3. Collyer.
- B. Building Wire:
  - 1. Feeders and Branch Circuits Larger Than 6 AWG: Copper, stranded conductor, 600 volt insulation.

2. Feeders and Branch Circuits 6 AWG and Smaller: Copper conductor, 600 volt insulation. 6 and 8 AWG, stranded conductor; smaller than 8 AWG, stranded conductor (solid for device terminations).
3. Control Circuits: Copper, stranded conductor, 600 volt insulation.
4. Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet.
5. Use conductor not smaller than 12 AWG for power and lighting circuits.
6. Use conductor not smaller than 16 AWG for control circuits.

C. Locations:

1. Concealed Dry Interior Locations: Use only building wire with Type THHN insulation in raceway.
2. Exposed Dry Interior Locations: Use only building wire with Type THHN insulation in raceway.
3. Above Accessible Ceilings: Use only building wire with Type THHN insulation in raceway.
4. Wet or Damp Interior Locations: Use only building wire with Type THWN insulation in raceway.
5. Exterior Locations: Use only building wire with Type XHHW insulation in raceway.
6. Underground Installations: Use only building wire with Type XHHW insulation in raceway.

### 2.03 WIRING DEVICES AND WALL PLATES

A. Single Pole Switch: Specification grade.

1. Hubbell Model 1121.
2. P & S Model 521.
3. Leviton Model 1121.
4. Color: White.

B. Three-way Switch: Specification grade.

1. Hubbell Model 1123.
2. P & S Model 523.
3. Leviton Model 1123.
4. Color: White.

C. Duplex Convenience Receptacle: Nema 5-20R, duplex, specification grade.

1. Hubbell.
2. Bryant.
3. Leviton.
4. Color: White.

D. GFCI Receptacle: Nema 5-20R, duplex, GFCI, specification grade.

1. Hubbell Model GF-5362.
2. Slater Model SIR-20-F.
3. Eagle Model 647.
4. Color: White.

E. Decorative Cover Plate:

1. Hubbell.
2. Bryant.
3. Leviton.
4. Description: White, metal.

## **2.04 RACEWAY REQUIREMENTS**

- A. Use only specified raceway in the following locations:
  - 1. Branch Circuits and Feeders:
    - a. Concealed Dry Interior Locations: Electrical metallic tubing.
    - b. Exposed Dry Interior Finished Locations: Electrical metallic tubing.
    - c. Exposed Dry Interior Unfinished Locations: Electrical metallic tubing.
    - d. All other locations: Galvanized Rigid Metallic Conduit.
- B. Size raceways for conductor type installed.
  - 1. Minimum Size Conduit Homerun to Panelboard: 3/4-inch.

## **2.05 METALLIC CONDUIT AND FITTINGS**

- A. Conduit:
  - 1. Rigid Steel Conduit: ANSI C80.1.
  - 2. Electrical metallic tubing: ANSI C80.3.
  - 3. Flexible Conduit: UL 1, zinc-coated steel.
    - a. Liquidtight Flexible Conduit: UL360. Fittings shall be specifically approved for use with this raceway.
- B. Conduit Fittings:
  - 1. Metal Fittings and Conduit Bodies: NEMA FB 1.
    - a. EMT fittings: Use set-screw indentor-type fittings.

## **2.06 CONDUIT HANGERS**

- A. Manufacturers:
  - 1. Minerrallac Electric Company.
  - 2. Substitutions: Or Approved Equal.
- B. Description:
  - 1. Standard conduit hanger, zinc-plated steel with bolts.
  - 2. Threaded rod and hardware: Plated finish, size and length as required for loading and conditions.

## **2.07 BEAM CLAMPS**

- A. Manufacturers:
  - 1. Appleton.
  - 2. Midwest.
  - 3. Raco.
- B. Description: Malleable beam clamp, zinc plated steel.

## **2.08 ELECTRICAL BOXES**

- A. Manufacturers:
  - 1. Raco.
  - 2. Steel City.
  - 3. Appleton.
  - 4. Substitutions: Or Approved Equal.

- B. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1, galvanized steel, suitable for installation in masonry:
- C. Equipment Support Boxes: Rated for weight of equipment supported; include 2 inch male fixture studs where required.
- D. Wet Location Outlet Boxes: Cast aluminum: Cast alloy, deep type, gasket cover, threaded hubs.

## **2.09 PENETRATION SEALANTS**

- A. Fire-rated assemblies: Provide firestopping of all penetrations made by Work under this Contract in accordance with provisions of Section 07 84 00 requirements.
- B. Thermal and Moisture Protection: Provide thermal and moisture protection made by Work under this Contract of all exterior wall, floor and roof penetrations in accordance with Division 7 requirements.

## **2.10 TWO CELL SURFACE METALLIC RACEWAY**

- A. Manufacturer:
  - 1. Wiremold G-4000 Series or equal.
- B. Description: UL-5, 4-3/4 inches wide by 1-3/4 inches height, two channel galvanized steel, combination power/data.
- C. Finish: Painted, ANSI 61 Gray.
- D. Accessories: Transition fittings, divider plates, device mounting straps, couplings, combination power/data cover plates, end plates and all other accessories necessary for a complete system in locations indicated on Drawings.

## **2.11 TWO CELL LOW PROFILE SURFACE METALLIC RACEWAY**

- A. Manufacturer:
  - 1. Wiremold 2400 Series or equal.
- B. Description: UL-5, 2 inches wide by 1 inch height, two channel galvanized steel, combination power/data.
- C. Finish: Painted, ANSI 61 Color Selected by architect.
- D. Accessories: Transition fittings, divider plates, device mounting straps, couplings, combination power/data cover plates, end plates and all other accessories necessary for a complete system in locations indicated on Drawings.

## **2.12 MOTION SENSORS**

- A. Manufacturers:
  - 1. Leviton
  - 2. Hubbell
  - 3. Approved Equal
- B. Combination Wall Switch/Occupancy Sensor
  - 1. Dual technology (passive infrared and ultrasonic), 120V sensor with 180 degree field-of-view and maximum coverage of 2400 square feet.
  - 2. Manual push button for ON/OFF light switching.

3. Time delay settings: 30 seconds, 10, 20 or 30 minutes).
4. Adjustable Integral blinders.
5. Sensor shall continuously monitor space to identify usage patterns. Unit shall automatically adjust time delay and sensitivity settings for optimal performance and energy efficiency.

C. Ceiling Mounted.

1. Dual technology (passive infrared and ultrasonic), 24VDC sensor with unobtrusive appearance and 360 degrees of coverage.
  - a. Provide type/quantity of motion sensors to meet square foot coverage requirements.
2. Provide power pack for 24VDC controls and switching of 120/277V circuits. Minimum quantity of sensors per power pack: 2.
3. Sensor shall continuously monitor space to identify usage patterns. Unit shall automatically adjust time delay and sensitivity settings for optimal performance and energy efficiency.
4. Time delay settings: Auto, fixed (5,10,15,20 or 30 minutes).
5. Sensitivity settings: Auto, reduced sensitivity (passive infrared) variable (ultrasonic).
6. (1) N/O and (1) N/C output.

## 2.13 NAMEPLATES AND LABELS

- A. Nameplates: Engraved three-layer laminated plastic, black letters on white background.
- B. Locations:
1. Each electrical distribution and control equipment enclosure.
- C. Letter Size:
1. Use 1/8 inch letters for identifying individual equipment and loads.
  2. Use 1/4 inch letters for identifying grouped equipment and loads.
- D. Labels: Embossed adhesive tape, with 3/16 inch white letters on a black background. Use only for identification of individual wall switches and receptacles and control device stations.

## 2.14 WIRE AND CABLE MARKERS

- A. Manufacturers:
1. Brady Model PCPS.
  2. Panduit Model PCM.
  3. T & B Model WM.
- B. Description: Cloth type wire markers.
- C. Locations: Each conductor at panelboard gutters, pull boxes, and each load connection.
- D. Legend:
1. Power and Lighting Circuits: Branch circuit or feeder number indicated on drawings.

## 2.15 CONDUIT MARKERS

- A. Location: Furnish markers for each conduit longer than 6 feet.
- B. Spacing: 20 feet on center.
- C. Color:
1. 208 Volt System: Black
  2. Fire Alarm System: Red.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION AND PREPARATION**

- A. Demolition Drawings are based on casual field observation and are intended to identify the limits of the construction site. Remove all electrical systems in their entirety in proper sequence with the Work.
- B. Disconnect electrical systems in walls, floors, and ceilings for removal.
- 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 and Emergency Electrical Service: Maintain existing system in service. Disable system only to make switchovers and connections. Obtain permission from Owner and Architect at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.
- E. Existing Fire Alarm System: Maintain existing system in service. Disable system only to make switchovers and connections. Notify Owner, Architect/Engineer and local fire service at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.
- F. Beginning of demolition means installer accepts existing conditions.
- G. Verify that supporting surfaces are ready to receive work.
- H. Electrical boxes are shown on Drawings, in approximate locations, unless dimensioned.
  - 1. Obtain verification from Architect/Engineer for locations of outlets throughout prior to rough-in.
- I. Degrease and clean surfaces to receive wire markers.
- J. Verify that interior of building is physically protected from weather.
- K. Verify that mechanical work which is likely to injure conductors has been completed.
- L. Completely and thoroughly swab raceway system before installing conductors.

### **3.02 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK**

- A. Remove all existing electrical installations to accommodate new construction.
- B. Remove abandoned wiring to source of supply.
- C. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- D. Relocate existing fire alarm devices affected by wall, ceiling and floor demolition.
- E. Repair adjacent construction and finishes damaged during demolition and extension work.
- F. Properly dispose of all ballast to approved ballast recycler. Do not land fill ballasts.

### **3.03 APPLICATION**

- A. Install nameplate and label parallel to equipment lines.

- B. Secure nameplate to equipment front using screws.
- C. Secure nameplates to inside surface of door on panelboard that is recessed in finished locations.
- D. Identify underground conduits using underground warning tape. Install one tape per trench at 3 inches below finished grade.
- E. Neatly train and secure wiring inside boxes, equipment, and panelboards.
- F. Use wire pulling lubricant for pulling 4 AWG and larger wires.
- G. Route wire and cable as required to meet project conditions.
  - 1. Wire and cable routing indicated is approximate unless dimensioned.
  - 2. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.
- H. Pull all conductors into raceway at same time.
- I. Protect exposed cable from damage.
- J. Neatly train and lace wiring inside boxes, equipment and panelboards.
- K. Support cables above accessible ceilings to keep them from resting on ceiling tiles.
- L. Make splices, taps, and terminations to carry full ampacity of conductors without perceptible temperature rise.
- M. Use split bolt connectors for copper conductor splices and taps, 6 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.
- N. Provide anchors, fasteners, and supports in accordance with NECA "Standard of Installation".
- O. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.
- P. Do not use powder-actuated anchors.
- Q. Do not drill or cut structural members.
- R. Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.
- S. Install surface-mounted cabinets and panelboards with minimum of four anchors.
- T. In wet and damp locations use steel channel supports to stand cabinets and panelboards one inch off wall.
- U. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.
- V. Terminate spare conductors with electrical tape.
- W. Do not share neutral conductor on load side of dimmers.
- X. Install wiring devices in accordance with manufacturer's instructions.
  - 1. Install wall switches at height shown on drawings, OFF position down.



2. Install convenience receptacles at height shown on drawings grounding pole on bottom.
  3. Install specific purpose receptacles at heights shown on Drawings.
- Y. Install wall plates flush and level.
1. Install decorative plates on switch, receptacle, and blank outlets in finished areas.
  2. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface-mounted outlets.

**END OF SECTION**

**SECTION 26 05 83  
WIRING CONNECTIONS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Electrical connections to equipment and devices not and integral part of the electrical distribution system.

**1.02 REFERENCE STANDARDS**

- A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

**1.03 ADMINISTRATIVE REQUIREMENTS**

- A. Provide conduit rough-in and electrical connection to powered equipment and devices identified in the Project Manual and on the Drawings. Refer specifically, but not limited to, these Specification Sections for further information:
  - 1. Section 08 71 00 - Door Hardware: Components electrically operated and/or controlled.
  - 2. Section 10 28 14 - Electric Hand Dryers.
  - 3. Section 22 30 00 - Plumbing Equipment.
  - 4. Section 23 34 23 - HVAC Power Ventilators.
  - 5. Section 23 82 00 - Convection Heating and Cooling Units.
  - 6. Section 28 46 00 - Fire Detection and Alarm.
- B. Coordination: Determine connection locations and requirements for furniture, equipment and devices furnished or provided under other sections.
  - 1. Do not rely solely on the Drawings and Project Manual for execution of the Work of this Section.
  - 2. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions.
  - 3. Include necessary field evaluation time to inspect connection requirements.
  - 4. Coordinate with other trades to determine exact rough-in requirements.
- C. Sequencing:
  - 1. Install rough-in of electrical connections before installation of furniture and equipment is required.
  - 2. Make electrical connections before required start-up of equipment.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide wiring device manufacturer's catalog information showing dimensions, configurations, and construction.
- C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

**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 - NOT USED.**

## **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 24 16 PANELBOARDS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Overcurrent protective devices for panelboards.

#### **1.02 REFERENCE STANDARDS**

- A. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service; 2013e, with Amendments (2022).
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
- C. NECA 407 - Standard for Installing and Maintaining Panelboards; 2015.
- D. NEMA KS 1 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum); 2013.
- E. NEMA PB 1 - Panelboards; 2011.
- F. NEMA PB 1.1 - General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 1000 Volts or Less; 2023.
- G. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems; 2021.
- H. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- I. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures; Current Edition, Including All Revisions.

#### **1.03 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. Notify Architect/Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

#### **1.04 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.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Receive, inspect, handle, and store panelboards in accordance with manufacturer's instructions and NECA 407.

- B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- C. Handle carefully in accordance with manufacturer's written instructions to avoid damage to panelboard internal components, enclosure, and finish.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Eaton Corporation: [www.eaton.com/#sle](http://www.eaton.com/#sle).
- B. Substitutions: See Section 01 60 00 - Product Requirements.

### **2.02 OVERCURRENT PROTECTIVE DEVICES**

- A. Molded Case Circuit Breakers:
  - 1. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.
  - 2. Interrupting Capacity:
    - a. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than:
      - 1) 10,000 rms symmetrical amperes at 240 VAC or 208 VAC.
    - b. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
  - 3. Conductor Terminations:
    - a. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
  - 4. Multi-Pole Circuit Breakers: Furnish with common trip for all poles.
  - 5. Provide the following circuit breaker types where indicated:
  - 6. Do not use tandem circuit breakers.
  - 7. Do not use handle ties in lieu of multi-pole circuit breakers.
  - 8. Provide multi-pole circuit breakers for multi-wire branch circuits as required by NFPA 70.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that the ratings and configurations of the panelboards and associated components are consistent with the indicated requirements.
- C. Verify that mounting surfaces are ready to receive panelboards.
- D. Verify that conditions are satisfactory for installation prior to starting work.

### **3.02 INSTALLATION**

- A. Perform work in accordance with NECA 1 (general workmanship).
- B. Install products in accordance with manufacturer's instructions.
- C. Install panelboards in accordance with NECA 407 and NEMA PB 1.1.

- D. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- E. Install all field-installed branch devices, components, and accessories.
- F. Provide filler plates to cover unused spaces in panelboards.
- G. Provide typed or neatly handwritten circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.
- H. Measure steady state load currents at each panelboard feeder; rearrange circuits in the panelboard to balance the phase loads to within 20 percent of each other. Maintain proper phasing for multi-wire branch circuits.

### **3.03 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. Correct deficiencies and replace damaged or defective panelboards or associated components.

### **3.04 ADJUSTING**

- A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.
- B. Adjust alignment of panelboard fronts.
- C. Load Balancing: For each panelboard, rearrange circuits such that the difference between each measured steady state phase load does not exceed 20 percent and adjust circuit directories accordingly. Maintain proper phasing for multi-wire branch circuits.

### **3.05 CLEANING**

- A. Clean dirt and debris from panelboard enclosures and components according to manufacturer's instructions.
- B. Repair scratched or marred exterior surfaces to match original factory finish.

**END OF SECTION**

**SECTION 26 51 00  
INTERIOR LUMINAIRES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Interior luminaires.
- B. Emergency lighting units.
- C. Exit signs.
- D. Accessories.

**1.02 REFERENCE STANDARDS**

- A. 47 CFR 15 - Radio Frequency Devices; current edition.
- B. IESNA LM-63 - ANSI Approved Standard File Format for Electronic Transfer of Photometric Data and Related Information; 2002 (Reaffirmed 2008).
- C. IES LM-79 - Approved Method: Optical and Electrical Measurements of Solid-State Lighting Products; 2019.
- D. IES LM-80 - Approved Method: Measuring Maintenance of Light Output Characteristics of Solid-State Light Sources; 2021.
- E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
- F. NECA/IESNA 500 - Standard for Installing Indoor Lighting Systems; 2006.
- G. NECA/IESNA 502 - Standard for Installing Industrial Lighting Systems; 2006.
- H. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility; 2012 (Reaffirmed 2018).
- I. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- J. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- K. UL 924 - Emergency Lighting and Power Equipment; 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.

**1.03 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others. Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.

2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections or by others.
3. Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to visibility installed under other sections or by others.
4. Notify Architect/Engineer of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

#### **1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  1. Provide photometric calculations where luminaires are proposed for substitution upon request.
  2. Indicate construction, installation and mounting details for products.
  3. Wiring Diagrams: Submit wiring diagrams for all exit sign, night light, self-contained back-up battery lighting, battery ballasts and associated circuit breakers, programmable circuit breakers and/or emergency circuit breakers.
- C. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.
  1. LED Luminaires:
    - a. Include estimated useful life, calculated based on IES LM-80 test data.
  2. Ballasts: Include wiring diagrams and list of compatible lamp configurations.
  3. Lamps: Include rated life, color temperature, color rendering index (CRI), and initial and mean lumen output.
- D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- E. Operation and Maintenance Data: Instructions for each product including information on replacement parts.
- 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 luminaires and any associated remote components.

#### **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.
- C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.



## **1.06 DELIVERY, STORAGE, AND PROTECTION**

- A. Receive, handle, and store products according to NECA/IESNA 500 (commercial lighting), NECA/IESNA 502 (industrial lighting), and manufacturer's written instructions.
- B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

## **1.07 FIELD CONDITIONS**

- A. Maintain field conditions within manufacturer's required service conditions during and after installation.

## **1.08 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide three year manufacturer warranty for LED luminaires, including drivers.

## **PART 2 PRODUCTS**

### **2.01 LUMINAIRE TYPES**

- A. Furnish products as indicated in luminaire schedule included on the drawings.
- B. Substitutions: See Section 01 60 00 - Product Requirements except where individual luminaire types are designated with substitutions not permitted.

### **2.02 LUMINAIRES**

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products that are listed and labeled as complying with UL 1598, where applicable.
- C. Provide products listed, classified, and labeled as suitable for the purpose intended.
- D. Provide products complying with Federal Energy Management Program (FEMP) requirements.
- E. 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.
- F. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.
- G. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.
- 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.

### **2.03 EMERGENCY LIGHTING UNITS**

- A. Description: Emergency lighting units complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.
- B. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.
- C. Battery:
  1. Sealed maintenance-free lead calcium unless otherwise indicated.
  2. Size battery to supply all connected lamps, including emergency remote heads where indicated.
- D. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.
- E. Provide low-voltage disconnect to prevent battery damage from deep discharge.
- F. Accessories:
  1. Provide compatible accessory mounting brackets where indicated or required to complete installation.
  2. Provide compatible accessory high impact polycarbonate vandal shields where indicated.
  3. Provide compatible accessory wire guards where indicated.
  4. Where indicated, provide emergency remote heads that are compatible with the emergency lighting unit they are connected to and suitable for the installed location.

### **2.04 EXIT SIGNS**

- A. Description: Exit signs complying with NFPA 101 and applicable state and local codes, and listed and labeled as complying with UL 924.
  1. Number of Faces: Single- or double-face as indicated or as required for installed location.
  2. Directional Arrows: As indicated or as required for installed location.
- B. Powered Exit Signs: Internally illuminated with LEDs unless otherwise indicated.
  1. Self-Powered Exit Signs:
    - a. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.
    - b. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.
    - c. Provide low-voltage disconnect to prevent battery damage from deep discharge.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
- C. Verify that suitable support frames are installed where required.
- D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
- E. Verify that conditions are satisfactory for installation prior to starting work.
- F. Examine substrate and supporting grids for luminaires.
- G. Examine each fixture to determine suitability for lamps specified.

### **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 as required for installation of luminaires provided under this section.
- B. Install products in accordance with manufacturer's instructions.
- C. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting) and NECA 502 (industrial lighting).
- D. Provide required support and attachment.
- E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
- F. Locate recessed ceiling luminaires as indicated on reflected ceiling plan.
- G. Install wall mounted luminaires, emergency units and exit signs at height as indicated on Drawings and directed in the field by Architect. Obtain final approval from Architect prior to commencement of this portion of work.
- H. Install accessories furnished with each luminaire.
- I. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.
- J. Suspended Ceiling Mounted Luminaires:
  - 1. Do not use ceiling tiles to bear weight of luminaires.
  - 2. Support luminaires larger than 2 foot by 4 foot size independent of ceiling framing.
  - 3. Secure lay-in luminaires to ceiling support channels using listed safety clips at four corners.
  - 4. See appropriate Division 9 section where suspended grid ceiling is specified for additional requirements.

- K. Recessed Luminaires:
  - 1. Install trims tight to mounting surface with no visible light leakage.
  - 2. Install recessed luminaires to permit removal from below.
  - 3. Install recessed luminaires using accessories and firestopping materials to meet regulatory requirements for fire rating.
  - 4. Install clips to secure recessed grid-supported luminaires in place.
- L. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to center of luminaire.
- M. Install accessories furnished with each luminaire.
- N. Bond products and metal accessories to branch circuit equipment grounding conductor.
- O. Emergency Lighting Units:
  - 1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.
- P. Exit Signs:
  - 1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.
- Q. Install lamps in each luminaire.
- R. Lamp Burn-In: Operate lamps at full output for prescribed period per manufacturer's recommendations prior to use with any dimming controls. Replace lamps that fail prematurely due to improper lamp burn-in.

### **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. Test self-powered exit signs, emergency lighting units, and fluorescent emergency power supply units to verify proper operation upon loss of normal power supply.
- E. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect/Engineer.
- F. Energy Code Commissioning: The electrical contractor shall program, test, calibrate and confirm the proper operation and placement of all lighting controls in accordance with the International Energy Code, 2021 Edition Paragraph C408.3 "Lighting system functional testing".

### **3.05 ADJUSTING**

- A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect/Engineer. Secure locking fittings in place.
- B. Aim and position adjustable emergency lighting unit lamps to achieve optimum illumination of egress path as required or as directed by Architect/Engineer or authority having jurisdiction.

- C. Exit Signs with Field-Selectable Directional Arrows: Set as indicated or as required to properly designate egress path as directed by Architect/Engineer or authority having jurisdiction.
- D. Relamp luminaires which have failed lamps at completion of work.

### **3.06 CLEANING**

- A. Clean surfaces according to NECA 500 (commercial lighting), NECA 502 (industrial lighting), 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. Demonstration: Demonstrate proper operation of luminaires to Architect/Engineer, and correct deficiencies or make adjustments as directed.
- C. Just prior to Substantial Completion, replace all lamps that have failed.
- D. Project record documents: Accurately record location of each luminaire.

### **3.08 PROTECTION**

- A. Protect installed luminaires from subsequent construction operations.

**END OF SECTION**

**SECTION 28 46 00  
FIRE DETECTION AND ALARM**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Fire alarm system modifications and installation, including all components, wiring, and conduit.
- B. Replacement, relocation and removal of existing fire alarm system components, wiring, and conduit indicated.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 84 00 - Firestopping: Materials and methods for work to be performed by this installer.
- B. Section 21 13 00 - Fire-Suppression Sprinkler Systems: Supervisory, alarm, and actuating devices installed in sprinkler system.

**1.03 REFERENCE STANDARDS**

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- B. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- C. IEEE C62.41.2 - IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits; 2002 (Corrigendum 2012).

**1.04 QUALITY ASSURANCE**

- A. Installer: Qualified firm with minimum 5 years documented experience installing fire alarm systems of the specified type and providing contract maintenance service as a regular part of their business.
  - 1. Authorized representative of control unit manufacturer; submit manufacturer's certification that installer is authorized; include name and title of manufacturer's representative making certification.
  - 2. Installer Personnel: At least 2 years of experience installing fire alarm systems.
  - 3. Supervisor: NICET level III or IV (3 or 4) certified fire alarm technician; furnish name and address.
- B. Maintenance Contractor: Same entity as installer or different entity with specified qualifications.
- C. Qualified personnel includes those persons that are:
  - 1. Factory trained and certified; OR
  - 2. NICET Level III or IV (3 or 4) Fire Alarm certified; OR
  - 3. International Municipal Signal Association Fire Alarm certified; OR
  - 4. Certified by state (Illinois Department of Professional Regulation); OR
  - 5. Trained, qualified, and employed by an organization listed by a national testing laboratory.

**1.05 WARRANTY**

- A. Provide installer's warranty that the installation is free from defects and will remain so for 1 year after date of Substantial Completion.

## 1.06 EXISTING CONDITIONS

- A. The existing fire alarm system control panel is a Fire-Lite MS-4 conventional system.
  - 1. The existing control panel will be modified and expanded to feed new devices as shown on the floor plans.
  - 2. Provide new equipment compatible with existing devices and system at site.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Initiating Devices and Notification Appliances:
  - 1. Provide initiating devices and notification appliances made by the same manufacturer, where possible.
- B. Substitutions: See Section 01 60 00 - Product Requirements.
  - 1. For substitution of products by manufacturers not listed, submit product data showing features and certification by Contractor that the design will comply with Contract Documents.

### 2.02 FIRE ALARM SYSTEM

- A. Fire Alarm System: Provide modifications and extensions to the existing automatic fire detection and alarm system:
  - 1. Provide all components necessary, regardless of whether shown in Contract Documents or not.
  - 2. Protected Premises: Entire building shown on drawings.
  - 3. Comply with the following; where requirements conflict, order of precedence of requirements is as listed:
    - a. ADA Standards.
    - b. The requirements of the local authority having jurisdiction which is Village of Oak Brook.
    - c. Applicable local codes.
    - d. Contract Documents (drawings and specifications).
    - e. NFPA 72; where the word "should" is used consider that provision mandatory; where conflicts between requirements require deviation from NFPA 72, identify deviations clearly on design documents.
  - 4. Evacuation Alarm: Single smoke zone; general evacuation of entire premises.
  - 5. Zoning: Point addressable system with initiating devices being individually zoned.
  - 6. Existing Control Panel: Make modifications to the existing panel:
    - a. Additional Power Supplies: Adequate to serve control panel modules, remote detectors, keypads, door holders, relays and alarm signaling devices. Include battery-operated emergency power supply with capacity for operating system in standby mode for 60 hours followed by alarm mode for 5 minutes.
- B. Supervising Stations and Fire Department Connections:
  - 1. Existing connections to remain.
- C. Circuits:
  - 1. Initiating Device Circuits (IDC): Class B, Style A.
  - 2. Signaling Line Circuits (SLC) Within Single Building: Class B, Style 0.5.
  - 3. Notification Appliance Circuits (NAC): Class B, Style W.
  - 4. All cabling shall be plenum rated.

D. Spare Capacity:

1. Initiating Device Circuits: Minimum 25 percent spare capacity.
2. Notification Appliance Circuits: Minimum 25 percent spare capacity.
3. Fire Alarm Control Units: Capable of handling all circuits utilized to capacity without requiring additional components other than plug-in control modules.

E. Power Sources:

1. Primary: Dedicated branch circuits of the facility power distribution system.
2. Secondary: Storage batteries.
3. Capacity: Sufficient to operate entire system for period specified by NFPA 72.
4. Each Computer System: Provide uninterruptible power supply (UPS).

## 2.03 EXISTING COMPONENTS

- A. Existing Fire Alarm System: Remove existing components indicated and incorporate remaining components into system, under warranty as if they were new; do not take existing portions of system out of service until new portions are fully operational, tested, and connected to existing system.
- B. Clearly label components that are "Not In Service."
- C. Remove unused existing components and materials from site and dispose of properly.

## 2.04 COMPONENTS

A. General:

1. Provide flush mounted units where installed in finish areas; in unfinished areas, surface mounted unit are acceptable.
2. Provide legible, permanent labels for each control device, using identification used in operation and maintenance data.

B. Initiating Devices:

1. Manual Pull Stations: Double action station, red finish. Analog.
2. Smoke Detectors: Addressable photoelectric smoke detector compatible with control panel. Each sensor shall be capable of being set at four sensitivity settings.
  - a. Automatic and manual functional sensitivity and performance tests shall be possible without the need for generating smoke.
  - b. Sensor shall have two LED visual indicators providing local 360 degree visibility of operating status and alarm indication. The LED shall pulse periodically indicating the sensor is receiving power and communication is being supplied.
  - c. Each sensor shall allow for the setting of two different sensitivity levels. These two levels shall be capable of being programmed with different sensitivities for occupied and unoccupied mode. This feature shall also incorporate programmable weekend days, where the sensor remain at an unoccupied sensitivity level all day.
  - d. Each sensor screen and cover shall be easily removable for field cleaning. Wire connections shall be made by clamping plate and screw.
  - e. Detector shall be a two-piece head and base unit.

C. Notification Appliances:

1. Horn/Strobes: NFPA 72 and UL 1971; electronic horn rated 90 dBA average at 10 feet. Provide integral 110 candela strobe lamp and flasher. Provide red trim ring for semi-flush



- mounting. Synchronize strobes within site of each other. Compatible with control panel.
2. Strobes: NFPA 72 and UL 1971; Provide integral 110 candela strobe lamp and flasher. Provide red trim ring for semi-flush mounting. Synchronize strobes within site of each other. Compatible with control panel.
- D. Zone Module Interface:
1. Single zone interface module shall provide an addressable input interface to the control panel for monitoring normally open contact devices. Mount inside NEMA 1 enclosure within 10 feet of first monitored device of zone. Compatible with control panel.
- E. Control Relay Module:
1. Programmable control relay shall be located within 10' of device to be controlled. Temporal sound pattern. Audio shall be synchronized.
- F. Circuit Conductors: Copper or optical fiber; provide 200 feet extra; color code and label.
- G. Surge Protection: In accordance with IEEE C62.41.2 category B combination waveform and NFPA 70; except for optical fiber conductors.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION AND PREPARATION**

- A. Field inspect existing fire alarm system installation to determine all required interface components necessary for fire alarm system replacement and relocation.
- B. Perform repair work on existing system to eliminate trouble conditions.

#### **3.02 INSTALLATION**

- A. Install in accordance with applicable codes, NFPA 72, NFPA 70, and Contract Documents.
- B. Install fire alarm system in accordance with manufacturer's instructions.
  1. Mount end-of-line device in separate box adjacent to sprinkler flow switch.
  2. Make conduit and wiring connections to fire suppression system at fire sprinkler riser and elevator tamper switches and duct smoke detectors.
  3. Install manual station with operating handle 4 feet above floor. Install horn strobe units 7.5 feet above floor.
- C. Conceal all wiring, conduit, boxes, and supports where installed in finished areas.
- D. Obtain Owner's approval of locations of devices, before installation.
- E. Install instruction cards and labels.

#### **3.03 INSPECTION AND TESTING FOR COMPLETION**

- A. Notify Owner 7 days prior to beginning completion inspections and tests.
- B. Notify authorities having jurisdiction and comply with their requirements for scheduling inspections and tests and for observation by their personnel.
- C. Provide the services of the installer's supervisor or person with equivalent qualifications to supervise inspection and testing, correction, and adjustments.

- D. Prepare for testing by ensuring that all work is complete and correct; perform preliminary tests as required.
- E. Provide all tools, software, and supplies required to accomplish inspection and testing.
- F. Perform inspection and testing in accordance with NFPA 72 and requirements of local authorities; document each inspection and test.
  - 1. Include description of testing and results in test report.
  - 2. Perform 100 percent acceptance test to NFPA 72 standards on system.
- G. Correct defective work, adjust for proper operation, and retest until entire system complies with Contract Documents.

### **3.04 CLOSEOUT**

- A. Closeout Demonstration: Demonstrate proper operation of all functions to Owner.
  - 1. Be prepared to conduct any of the required tests.
  - 2. Have at least one copy of operation and maintenance data, preliminary copy of project record drawings, input/output matrix, and operator instruction chart(s) available during demonstration.
  - 3. Have authorized technical representative of control unit manufacturer present during demonstration.
  - 4. Demonstration may be combined with inspection and testing required by authority having jurisdiction; notify authority having jurisdiction in time to schedule demonstration.
  - 5. Repeat demonstration until successful.
- B. Substantial Completion of the project cannot be achieved until inspection and testing is successful and:
  - 1. All aspects of operation have been demonstrated to Owner.
  - 2. Final acceptance of the fire alarm system has been given by authorities having jurisdiction.

**END OF SECTION**

**SECTION 31 23 23**  
**FILL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Filling, backfilling, and compacting for footings, slabs-on-grade, paving, and utilities within the building.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 30 00 - Cast-in-Place Concrete.

**1.03 DELIVERY, STORAGE, AND HANDLING**

- A. When necessary, store materials on site in advance of need.
- B. When fill materials need to be stored on site, locate stockpiles where indicated.
  - 1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
  - 2. Prevent contamination.
  - 3. Protect stockpiles from erosion and deterioration of materials.

**1.04 SEQUENCING AND SCHEDULING**

- A. Schedule, sequence and coordinate the work of this section, and prior and subsequent portions of the work, in accordance with the requirements of Section 01 40 00 - Quality Requirements.

**PART 2 PRODUCTS**

**2.01 FILL MATERIALS**

- A. General Fill: Subsoil excavated on-site.
  - 1. Graded.
  - 2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris, waste, frozen materials, vegetable and other deleterious matter.
- B. Structural Fill: Subsoil excavated on-site.
  - 1. Graded.
  - 2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris, waste frozen materials, vegetable and other deleterious matter.
- C. Granular Fill: Crushed stone conforming to SSRBC; CA-6.
- D. Topsoil: Topsoil excavated on-site.
  - 1. Graded.
  - 2. Free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds and foreign matter.
  - 3. Acidity range (pH) of 5.5 to 7.5.
  - 4. Containing a minimum of 4 percent and a maximum of 25 percent inorganic matter.

**2.02 SOURCE QUALITY CONTROL**

- A. See Section 01 40 00 - Quality Requirements, for general requirements for testing and analysis of soil material.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that survey bench marks and intended elevations for the Work are as indicated.
- B. Identify required lines, levels, contours, and datum locations.
- C. Verify structural ability of unsupported walls to support imposed loads by the fill.
- D. Verify areas to be filled are not compromised with surface or ground water.

### **3.02 PREPARATION**

- A. Scarify and proof roll subgrade surface to a depth of 6 inches to identify soft spots.
- B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.
- C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
- D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

### **3.03 FILLING**

- A. Fill to contours and elevations indicated using unfrozen materials.
- B. Fill up to subgrade elevations unless otherwise indicated.
- C. Employ a placement method that does not disturb or damage other work.
- D. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
- E. Maintain optimum moisture content of fill materials to attain required compaction density.
- F. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.
- G. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth.
- H. Slope grade away from building minimum 2 inches in 10 feet, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.
- I. Correct areas that are over-excavated.
  - 1. Load-bearing foundation surfaces: Use structural fill, flush to required elevation, compacted to 98 percent of maximum dry density.
  - 2. Other areas: Use general fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density.
- J. Compaction Density Unless Otherwise Specified or Indicated:
  - 1. Under paving, slabs-on-grade, and similar construction: 95 percent of maximum dry density.
  - 2. At areas under building foundations: 98 percent of maximum dry density.
  - 3. At other locations: 90 percent of maximum dry density.
- K. Reshape and re-compact fills subjected to vehicular traffic.

- L. Maintain temporary means and methods, as required, to remove all water while fill is being placed as required, or until directed by the Architect/Engineer. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.

### **3.04 FILL AT SPECIFIC LOCATIONS**

- A. Under Interior Slabs-On-Grade:
  - 1. Use granular fill.
  - 2. Compact to 95 percent of maximum dry density.
- B. At Foundation Walls and Footings:
  - 1. Do not backfill against unsupported foundation walls.
- C. Over Buried Utility Piping, Conduits, and Duct Bank in Trenches:
  - 1. Cover with general fill.
  - 2. Fill up to subgrade elevation.
  - 3. Compact in maximum 8 inch lifts to 95 percent of maximum dry density.
- D. At Lawn Areas:
  - 1. Use general fill.
  - 2. Compact to 90 percent of maximum dry density.
  - 3. See Section 31 22 00 for topsoil placement.
- E. Under Monolithic Paving :
  - 1. Compact subsoil to 95 percent of its maximum dry density before placing fill.
  - 2. Use general fill.
  - 3. Fill up to 13 inches below finish paving elevation, unless indicated otherwise on the Drawings.
  - 4. Compact to 95 percent of maximum dry density.
  - 5. See Section 32 11 23 for aggregate base course placed over fill.

### **3.05 TOLERANCES**

- A. Top Surface of General Filling: Plus or minus 1 inch from required elevations.
- B. Top Surface of Filling Under Paved Areas: Plus or minus 1 inch from required elevations.

### **3.06 CLEANING**

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

**END OF SECTION**