

UNALASKA PUBLIC LIBRARY IMPROVEMENTS

CONSTRUCTION DOCUMENT specifications

Update and Reprint during Bidding

October 8, 2021

Unalaska Public Library
Library Expansion Project

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**SECTION 01 1000
SUMMARY AND ALTERNATES**

PART 1 GENERAL

1.01 PROJECT SUMMAR

- A. Project Name: Unalaska Public Library
- B. Owner's Name: City of Unalaska.
- C. Architect's Name: ECI, Inc..
- D. The Project consists of the selective demolition, remodel and addition of and to the Unalaska Public Library. This includes but is not limited to the following:
 - 1. Selective demolition of the north wall and entry vestibule of the existing facility to accommodate the addition.
 - 2. Addition area is approximately 3,570 sq ft including children's library, teen space, study rooms, large gathering room, entry vestibule, lobby and exterior entry with wind screen structure and roof extension (screen panels OFOI).
 - 3. Demolition of the north portion of the existing roof down to the existing structure.
 - 4. Selective demolition of interior spaces and ceilings to allow for remodeled configurations and associated mechanical, electrical and structural upgrades.
 - 5. Providing new floor and wall finishes in most spaces throughout the building.
 - 6. Providing new ceilings for most spaces.
 - 7. Providing new fixtures, accessories and finishes for existing public restrooms.
 - a. This will include re-leveling the sub-floor to provide slopes to the existing drains.
 - 8. Painting of the entire exterior of the building including new and existing portions to remain.
 - 9. Provision of two new boiler exhaust vents with new roof curb in the existing south portion of the roof.
 - 10. Provision of new propane fueled fireplace and exterior mounted tank with associated underground piping, roof mounted curb and flue, and double sided fireplace appliance.
 - 11. Replacement and refurbishment of mechanical systems as indicated.
 - 12. Replacement of the building fire alarm system.
 - 13. Replacement of selected existing windows with new operable windows as indicated.
 - 14. Providing electrical system modifications and upgrades as indicated.
 - 15. Lighting upgrades throughout.
 - 16. New construction of the entire north side of the roof over the existing roof.
 - 17. Civil improvements including selective demolition, asphalt pavement, concrete paving, curb and sidewalk, storm drain and miscellaneous items.
 - 18. Exterior in-slab snow melt heating system.
 - 19. Limited landscaping. Most plantings OFOI.
- E. Additive Alternates: Not Used

1.02 CONTRACT DESCRIPTION

- A. Contract Type: A single prime contract as described in the solicitation to Bidders.

1.03 DESCRIPTION OF ALTERATIONS, REMODEL AND ADDITION WORK

- A. Scope of demolition and removal work is indicated on drawings and specified in Section 02 4100.
- B. Renovate the following areas completely, including mechanical, electrical, data and fire protection systems, ceilings, casework, finishes, and Lighting:
 - 1. Main library public use areas.
 - 2. Study rooms.
 - 3. Reading rooms and computer rooms used by the public.
 - 4. Lobbies and restroom facilities used by the public..
 - 5. Storage and janitor areas as indicated.
 - 6. Exterior entry patio, glass windscreen, and sidewalk
 - 7. Mechanical and electrical system upgrades as indicated.
 - 8. Mechanical and electrical equipment additions and extensions of existing systems.
- C. Renovate the following areas with life safety upgrades and finishes as indicated.

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1. Director's office
 2. Staff work area.
 3. Existing Storage areas not identified for remodel.
 4. Existing Meeting Room 107
 5. Support spaces not otherwise identified for alteration.
- D. Plumbing: Alter existing system and add new construction, keeping existing in operation.
- E. HVAC: Alter existing system and add new construction, keeping existing in operation.
- F. Electrical Power and Lighting: Alter existing system and add new construction, keeping existing in operation.
- G. Fire Suppression Sprinklers: Alter existing system and add new construction, keeping existing in operation.
- H. Fire Alarm: Replace existing system with new construction, keeping existing in operation until ready for changeover.
- I. Telephone: Alter existing system and add new construction, keeping existing in operation.
- J. Security System: Provide new system throughout as indicated. Remove any existing elements..
- K. Exterior snowmelt system: Replace existing system with new construction.
- L. Contractor shall remove and store the following prior to start of work, for later reinstallation by Contractor:
1. Free standing library shelving units.
 2. Casework identified for reinstallation

1.04 ALLOWANCES

- A. Not Used

1.05 WORK BY OWNER

- A. Owner has awarded a contract for supply and installation of several artworks which will be installed by the artist or owner after the date of substantial completion or earlier if agreed upon by contractor and owner.
- B. Owner will pack and store all library furnishings, window coverings, wall mounted items, fire extinguishers, AED devices and other salvagable items not identified for contractor salvage prior to construction.
- C. Items noted NIC (Not in Contract) will be supplied and installed by Owner before Substantial Completion.

1.06 OWNER OCCUPANCY

- A. Owner intends to occupy the Project upon Substantial Completion.
- B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

1.07 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: Limited to areas noted on Drawings.
1. Locate and conduct construction activities in ways that will limit disturbance to site.
- B. 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.
- C. Existing building spaces may not be used for construction material storage unless explicitly described in the contractor's workplan and approved by the owner.
1. Stored shelving units outlined above may be stored on site or off site at contractor's option.
- D. Time Restrictions:
1. Limit conduct of especially noisy exterior work to the hours of 8am - 5pm.

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E. Utility Outages and Shutdown:

1. Limit disruption of utility services to hours the building is unoccupied.
2. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 days notice to Owner and authorities having jurisdiction.
3. Prevent disruption of utility services to other facilities.
4. Provide separate temporary toilet facilities for workforce. Do not use existing facilities.

1.08 WORK SEQUENCE

- A. Coordinate construction schedule and operations with Owner and Architect

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

**SECTION 01 2500
SUBSTITUTION PROCEDURES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedural requirements for proposed substitutions.

1.02 RELATED REQUIREMENTS

- A. Section 01 3000 - Administrative Requirements: Submittal procedures, coordination.
- B. Section 01 6000 - Product Requirements: Fundamental product requirements, product options, delivery, storage, and handling.

1.03 DEFINITIONS

- A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
 - 1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
 - 2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.

1.04 REFERENCE STANDARDS

- A. CSI/CSC Form 1.5C - Substitution Request (During the Bidding/Negotiating Stage) Current Edition.
- B. CSI/CSC Form 13.1A - Substitution Request (After the Bidding/Negotiating Phase) Current Edition.
- C. Side-by-Side Detailed comparison to Basis of Design Product is required with each form.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 - 2. Agrees to provide the same warranty for the substitution as for the specified product.
 - 3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
 - 4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
 - 5. Waives claims for additional costs or time extension that may subsequently become apparent.
 - 6. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
- B. A Substitution Request for specified installer constitutes a representation that the submitter:
 - 1. Has acted in good faith to obtain services of specified installer, but was unable to come to commercial, or other terms.
- C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents and equal quality and performance to Basis-of-Design products. Burden of proof is on proposer.
 - 1. Note explicitly any non-compliant characteristics.
- D. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
 - 1. Submit all Substitution Requests on CSI Substitution Request Form.
 - 2. In addition to the CSI form, provide the following on a separate sheet.
 - a. Project Information:
 - 1) Official project name and number, and any additional required identifiers established in Contract Documents.
 - b. Substitution Request Information:

- 1) Indication of whether the substitution is for cause or convenience.
 - 2) Issue date.
 - 3) Reference to particular Contract Document(s) specification section number, title, and article/paragraph(s).
 - 4) Description of Substitution.
 - 5) Reason why the specified item cannot be provided.
 - 6) Differences between proposed substitution and specified item.
 - 7) Description of how proposed substitution affects other parts of work.
 - c. Attached Comparative Data: Provide point-by-point, side-by-side comparison addressing essential attributes specified, as appropriate and relevant for the item:
 - 1) Physical characteristics.
 - 2) In-service performance.
 - 3) Expected durability.
 - 4) Visual effect.
 - 5) Sustainable design features.
 - 6) Warranties.
 - 7) Other salient features and requirements.
 - 8) Include, as appropriate or requested, the following types of documentation:
 - (a) Product Data:
 - (b) Samples.
 - (c) Certificates, test, reports or similar qualification data.
 - (d) Drawings, when required to show impact on adjacent construction elements.
 - d. Impact of Substitution:
 - 1) Savings to Owner for accepting substitution.
 - 2) Change to Contract Time due to accepting substitution.
- E. Limit each request to a single proposed substitution item.
1. Submit an electronic document, combining the request form with supporting data into single document with pdf bookmarks for each item.

3.02 SUBSTITUTION PROCEDURES DURING BIDDING PHASE

- A. Submittal Form (before contract award):
1. Submit substitution requests by completing CSI/CSC Form 1.5C - Substitution Request (During the Bidding/Negotiating Stage).
 2. Submit side-by-side comparison as outlined in section 3.01
- B. Owner will consider requests for substitutions only if submitted at least 10 days prior to the date for receipt of bids.

3.03 SUBSTITUTION PROCEDURES AFTER BIDDING PHASE

- A. Submittal Form (after contract award):
1. Submit substitution requests by completing CSI/CSC Form 13.1A - Substitution Request. See this form for additional information and instructions.
 2. Submit side-by-side comparison as outlined in section 3.01
- B. Architect will consider requests for substitutions only within 30 days after date of Agreement.
- C. Submit request for Substitution for Convenience within 14 days of discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
1. In addition to meeting general documentation requirements, document how the requested substitution benefits the Owner through cost savings, time savings, greater energy conservation, or in other specific ways.
 2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
 3. Bear the costs engendered by proposed substitution of:
 - a. Owner's compensation to the Architect for any required redesign, time spent processing and evaluating the request.

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- b. Other construction by Owner.
- c. Other unanticipated project considerations.
- D. Substitutions will not be considered under one or more of the following circumstances:
 - 1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
 - 2. Without a separate written request.
 - 3. When acceptance will require revisions to the Contract Documents.

3.04 RESOLUTION

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

3.05 ACCEPTANCE

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

END OF SECTION

SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General administrative requirements.
- B. Electronic document organization.
- C. Preconstruction meeting.
- D. Site mobilization meeting.
- E. Progress meetings.
- F. Construction progress schedule.
- G. Contractor's daily reports.
- H. Progress photographs.
- I. Coordination drawings.
- J. Coordination.
- K. Submittals for review, information, and project closeout.
- L. Number of copies of submittals.
- M. Requests for Interpretation (RFI) procedures.
- N. Submittal procedures.
- O. Shop Drawings.
- P. Requests For Information

1.02 RELATED REQUIREMENTS

- A. Division 0 - General Conditions
- B. Section 01 7000 - Execution and Closeout Requirements: Additional coordination requirements.
- C. Section 01 7800 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1.03 GENERAL ADMINISTRATIVE REQUIREMENTS

- A. Conform to requirements of Section 01 7000 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.
- B. Comply with requirements of General Conditions and Supplementary Conditions.
- C. Make the following types of submittals to Owner's Representative:
 - 1. Requests for Interpretation (RFI).
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.
 - 5. Design data.
 - 6. Manufacturer's instructions and field reports.
 - 7. Applications for payment and change order requests.
 - 8. Progress schedules.
 - 9. Coordination drawings.
 - 10. Correction Punch List and Final Correction Punch List for Substantial Completion.
 - 11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTALS

- A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF) format and transmitted via email and archived on a box site or other open access platform.

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1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
 2. Architect and Contractor are required to use this process.
 3. It is the contractor's responsibility to submit documents in PDF format.
 - a. PDF shall be bookmarked and text searchable.
 4. Paper document transmittals will not be reviewed.
 5. All other specified submittal and document transmission procedures apply, .
 6. Electronic document requirements apply to samples or color selection charts via image submission with description as well as physical sample.
 7. File naming conventions will be determined by the Architect at the pre-construction meeting.
 8. Markup notations on submittals shall be distinguishable between reviewers. (Contractor, subcontractor, Architect, etc. by color, font, or initials). Method to be established at preconstruction meeting.
 9. Contractor shall submit a sample template submittal with bookmarks, review marks and images at pre-construction meeting.
 10. Important information to be highlighted in green or orange. Yellow may not be used.
- B. Cost: The cost of the service , if any, will be paid by Owner.
- C. Training: One thirty minute training session will be arranged for all participants, with representatives of Owner, Architect and Contractor participating.
 1. Architect will provide this training if no paid service provider is selected by the owner.
- D. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

3.02 PRECONSTRUCTION MEETING

- A. Owner's Representative will schedule meeting after Notice of Award.
- B. Attendance Required:
 1. Owner's Representative or Contracting Officer
 2. Architect.
 3. Contractor.
 4. Plumbing, Electrical, Roofing and HVAC subcontractors..
- C. Agenda:
 1. Review of executed Owner-Contractor Agreement.
 2. Distribution of Contract Documents.
 3. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
 4. Designation of personnel representing the parties to Contract including Owner's representative, Contracting Officer, Contractor and Architect.
 5. Procedures and processing of field decisions, submittals, substitutions, proposal request, Change Orders, and Contract closeout procedures.
 6. Scheduling.
 7. Safety and Security procedures and training.
 8. Security and housekeeping procedures.
 9. Application for payment procedures.
 10. Procedures for Testing.
 11. Special inspections.
- D. Owner's representative will Record minutes and distribute copies within five days after meeting to participants, with copies to Owner, Architect, Contractor, participants, and those affected by decisions made.

3.03 SITE MOBILIZATION MEETING

- A. Owner's Representative will schedule meeting at the Project site prior to Contractor occupancy.
- B. Attendance Required:
 - 1. Contractor.
 - 2. Owner's representative or contracting officer.
 - 3. Architect.
 - 4. Contractor's superintendent.
 - 5. Major subcontractors.
- C. Agenda:
 - 1. Use of premises by Owner and Contractor.
 - 2. Owner's requirements and occupancy prior to completion.
 - 3. Construction facilities and controls provided by Owner.
 - 4. Temporary utilities provided by Owner.
 - 5. Survey and building layout.
 - 6. Security and housekeeping procedures.
 - 7. Schedules.
 - 8. Application for payment procedures.
 - 9. Procedures for testing.
 - 10. Procedures for maintaining record documents.
 - 11. Requirements for start-up of equipment.
 - 12. Inspection and acceptance of equipment put into service during construction period.
- D. Owner's representative or Architect will record minutes and distribute copies within five days after meeting to participants, with copies to participants, and those affected by decisions made.

3.04 PROGRESS MEETINGS

- A. Owner's representative will schedule and administer meetings throughout progress of the Work at maximum bi-weekly intervals.
- B. Make arrangements for meetings and prepare agenda with copies for participants.
- C. Attendance Required:
 - 1. Contractor.
 - 2. Owner's Representative/Contracting Officer.
 - 3. Architect.
 - 4. Contractor's superintendent.
 - 5. Major subcontractors.
- D. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems that impede, or will impede, planned progress.
 - 5. Review of submittals schedule and status of submittals. Spreadsheet to be updated and submitted by contractor.
 - 6. Review of RFIs log and status of responses.
 - 7. Review of off-site fabrication and delivery schedules.
 - 8. Maintenance of progress schedule.
 - 9. Corrective measures to regain projected schedules.
 - 10. Planned progress during succeeding work period.
 - 11. Maintenance of quality and work standards.
 - 12. Effect of proposed changes on progress schedule and coordination.
 - 13. Other business relating to work.
- E. Owner's Representative or Architect will record minutes and distribute copies within five days after meeting to participants, with copies to participants, and those affected by decisions made.

3.05 WEEKLY CONSTRUCTION REPORTS

- A. Include only factual information. Do not include personal remarks or opinions regarding operations and/or personnel.
- B. Prepare a daily construction report recording the following information concerning events at Project site and project progress:
 - 1. Date .
 - 2. High and low temperatures, and general weather conditions.
 - 3. Six or more Digital Images that best represent all aspects of work underway.
 - 4. List of subcontractors with hours of attendance at Project site.
 - 5. Approximate count of personnel at Project site.
 - a. Include a breakdown for supervisors, laborers, journeymen, equipment operators, and helpers.
 - 6. Major equipment at Project site.
 - 7. Material deliveries.
 - 8. Safety, environmental, or industrial relations incidents.
 - 9. Meetings and significant decisions including parties to those decisions.
 - 10. Visitors on site.
 - 11. Unusual events (submit a separate special report also).
 - 12. Stoppages, delays, shortages, and losses. Include comparison between scheduled work activities (in Contractor's most recently updated and published schedule) and actual activities. Explain differences, if any. Note days or periods when no work was in progress and explain the reasons why.
 - 13. Weekly meter readings and similar recordings.
 - 14. Emergency procedures.
 - 15. Directives and requests of Authority(s) Having Jurisdiction (AHJ).
 - 16. Change Orders received and implemented.
 - 17. Testing and/or inspections performed.
 - 18. Anticipated RFI or Change order concerns
 - 19. Signature of Contractor's authorized representative.
 - 20. Provide a draft of the daily log format to the Owner's Representative for review within 15 days after the date of the Agreement and bring a copy to the pre construction meeting.
 - 21. Post daily logs to the Electronic Document site at the end of each week.

3.06 PROGRESS PHOTOGRAPHS

- A. In addition to photos in Daily Reports, submit a minimum of 10 photographs with each application for payment, taken not more than 3 days prior to submission of application for payment.
- B. Photography Type: Digital; electronic files.
 - 1. Provide in jpeg format with each photo a discrete file name with the date and time of the photo embeded in the file or printed on the image.
- C. In addition to periodic, recurring views, take photographs of each of the following events prior to concealment unless noted otherwise:
 - 1. Completion of site clearing/ demolition.
 - 2. Underslab vapor barrier prior to concealment.
 - 3. Foundations in progress and upon completion.
 - 4. Structural framing in progress and upon completion.
 - 5. Z furring at insulation prior to concealment.
 - 6. Vapor retarders in progress and upon completion.
 - 7. Roof underlayments in progress and upon completion.
 - 8. Roof penetrations in progress and upon completion.
 - 9. Electrical and Plumbing rough in
 - 10. Radiant tubing layouts for snowmelt.
 - 11. Insulation installation in progress and upon completion.
 - 12. Weather barrier installation.

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13. Window rough in and prep prior to window installation.
 14. Enclosure of building, upon completion.
 15. Final completion, minimum of twenty photos.
- D. Take photographs as evidence of existing project conditions as follows:
1. Interior views: existing conditions in all major areas..
 2. Exterior views: existing conditions in all major areas.
- E. Views:
1. Provide non-aerial photographs from four cardinal views at bi monthly interval, until Date of Substantial Completion.
 2. Consult with Architect for instructions on additional views required.
 3. Provide factual presentation.
 4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.
- F. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG forma, date stamped; provide files unaltered by photo editing software.
1. File Naming: Include date of view and view identification.
 2. Photo CD(s): Provide 1 copy including all photos cumulative to date at project closeout, with files organized in separate folders by submittal date.

3.07 REQUESTS FOR INTERPRETATION(RFI)

- A. Definition: A request seeking one of the following:
1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in the Contract Documents.
 2. A resolution to an issue which has arisen due to field conditions.
- B. Preparation: The contractor is required to prepare an RFI immediately upon discovery of a need for interpretation of the Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
1. Prepare a separate RFI for each specific item.
 - a. Review, confirm validity, 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.
- C. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
1. Unacceptable Uses for RFIs: Do not use RFIs to request the following:
 - a. Approval of submittals (use procedures specified elsewhere in this section).
 - b. Approval of substitutions (see Section - 01 6000 - Product Requirements)
 2. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, the Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
 - a. The Owner reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Architect, and any of its consultants, due to processing of such RFIs.
- D. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
- E. 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 on a regular basis and provide updated log prior to each progress meeting.
 2. Note dates of when each request is made, and when a response is received.

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3. Highlight items requiring priority or expedited response.
 4. Highlight items for which a timely response has not been received to date.
- F. Review Time: Architect will respond and return RFIs to Contractor within 10 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.
- G. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
 2. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
 3. Notify Architect 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.

3.08 SUBMITTAL SCHEDULE

- A. Submit to Architect for review a schedule for submittals in tabular format.
1. Format schedule to allow tracking of status of submittals throughout duration of construction.
 2. 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.

3.09 SUBMITTALS FOR REVIEW

- A. When products or fabrications are specified in individual sections **or** identified in drawing, submit the following for review:
1. Product data.
 - a. Identified by specification item or drawing reference.
 2. Shop drawings.
 3. Samples for selection and digital images of samples.
 4. Samples for verification and digital images of samples.
- B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
- C. Samples will be reviewed for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

3.10 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
1. Design data.
 2. Certificates.
 3. Test reports.
 4. Inspection reports.
 5. Manufacturer's instructions.
 6. Manufacturer's field reports.
 7. Other types indicated.
- B. Submit for Architect's knowledge as contract administrator or for Owner.

3.11 SUBMITTALS FOR PROJECT CLOSEOUT

- A. At least three days prior to scheduled substantial completion, submit contractor's Correction Punch List for Substantial Completion.
- B. At least three days prior to scheduled final inspection, submit Final Correction Punch List indicating how and when all punch list items have been addressed, with each item signed off by the responsible subcontractor's foreman and general contractor's superintendent.
- C. For each specification, as applicable, submit at project closeout:
 - 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.
- E. Architect to have a minimum of 10 working days to review each submittal.
- F. Submittals shall contain all items identified in that specification section to be considered complete.
 - 1. Incomplete submittals may be rejected.
- G. Resubmittals shall be complete and include all previous markups or clearly identify any new or replaced information to be reviewed.

3.12 NUMBER OF COPIES OF SUBMITTALS

- A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
- B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.

3.13 SUBMITTAL PROCEDURES

- A. General Requirements:
- B. Shop Drawing Procedures:
 - 1. The shop drawing should address the appearance, performance, and prescriptive descriptions in the specifications and construction drawings through layout and detail drawings specific to the fabrications being provided.
 - 2. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting the Contract Documents and coordinating related Work.
 - 3. Do not reproduce the Contract Documents to create shop drawings.
 - 4. Generic, non-project specific information submitted as shop drawings do not meet the requirements for shop drawings.
- C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.
- D. 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.
- E. Schedule submittals to expedite the Project, and coordinate submission of related items.
- F. Submittal shall include all subsections completed. Partial submittals will not be accepted.
- G. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.
- H. When revised for resubmission, identify all changes made since previous submission with date and revision cloud.
- I. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

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- J. Submittals are required on all products, systems and fabrications identified in the specifications **or** drawings. It is the contractor's responsibility to ensure information is submitted for each product, fabrication or system.

3.14 COORDINATION

- A. Contractor shall coordinate construction operations included in different sections of the contract documents to ensure efficient and orderly installation of each part of the Work.
 - 1. Schedule construction operations in sequence require to obtain the best results where installation of one part of ht Work depends on installation of other components, before or after its installation.
 - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service and repair including mechanical and electrical items.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, special inspections and list of attendees at meetings.
- C. Administrative Procedures: Coordinate the schedule and timing of required administrative procedures and construction activities to ensure orderly progress of the Work.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water and materials.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into the Work. Owner shall have first rights to any salvaged materials and equipment.

3.15 INFORMATION BULLETIN

- A. Information Bulletin is provided by the Architect or Owner to give additional information to the contractor.
 - 1. The additional information may or may not result in a change to the Contract Time or Contract Sum.
 - 2. In the event the contractor believes the Information Bulletin warrants change in the Contract Time or the Contract Sum, they will notify the Owner and Architect in writing within 10 days of the receipt of the Information Bulletin and/or prior to the incorporation of the change, whichever comes first.
- B. Information Bulletins shall be entered and logged into the Electronic Document system in a timely manner.

END OF SECTION

SECTION 01 3216
CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 RELATED SECTIONS

- A. Section 01 1000 - Summary and Alternates: Work sequence.

1.03 REFERENCES

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

1.04 SUBMITTALS

- A. Refer to GENERAL CONDITIONS, section 6.6, for timeframe to submit schedule.
- B. Submit updated schedule with each Application for Payment.

1.05 QUALITY ASSURANCE

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

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE

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

3.02 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by specification section number or division as appropriate.
- C. Identify work of separate stages and other logically grouped activities.
- D. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- E. Provide separate schedule of submittal dates for shop drawings, product data, and samples, and dates reviewed submittals will be required from Architect. Indicate decision dates for selection of finishes.
- F. Indicate delivery dates for products identified under Allowances.
- G. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS

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

3.04 NETWORK ANALYSIS

- A. Prepare network analysis diagrams and supporting mathematical analyses using the Critical Path Method.
- B. Illustrate order and interdependence of activities and sequence of work; how start of a given activity depends on completion of preceding activities, and how completion of the activity may restrain start of subsequent activities.
- C. Mathematical Analysis: Tabulate each activity of detailed network diagrams, using calendar dates, and identify for each activity:
 - 1. Preceding and following event numbers.
 - 2. Activity description.

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3. Estimated duration of activity, in maximum 15 day intervals.
 4. Earliest start date.
 5. Earliest finish date.
 6. Actual start date.
 7. Actual finish date.
 8. Latest start date.
 9. Latest finish date.
 10. Monetary value of activity, keyed to Schedule of Values.
 11. Percentage of activity completed.
 12. Responsibility.
- D. Required Reports: List activities in sorts or groups:
1. By preceding work item or event number from lowest to highest.
 2. By amount of float, then in order of early start.

3.05 REVIEW AND EVALUATION OF SCHEDULE

- A. Participate in joint review and evaluation of schedule with Architect at each submittal.
- B. Evaluate project status to determine work behind schedule and work ahead of schedule.
- C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.06 UPDATING SCHEDULE

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity.
- C. Annotate diagrams to graphically depict current status of Work.
- D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- E. Indicate changes required to maintain Date of Substantial Completion.
- F. Submit reports required to support recommended changes.

3.07 DISTRIBUTION OF SCHEDULE

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

END OF SECTION

SECTION 01 4000
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. References and standards.
- B. Quality assurance submittals.
- C. Control of installation.
- D. Testing and inspection services.
- E. Manufacturers' field services.

1.02 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control. Quality Control is the sole responsibility of the Contractor. Quality Assurance is the responsibility of the Owner.
- B. Quality Control System: Establish and maintain an effective quality control system in compliance with these specifications. The Contractor Quality Control system shall consist of plans, procedures, and organization necessary to provide materials, equipment, workmanship, fabrication, construction and operations, both on-site and off-site, that complies with the contract requirements and is keyed with the construction schedule. Review and certify as correct and complete, and in compliance with contract requirements, shop drawings and list of materials, fixtures and equipment as required by technical specifications.
- C. Recurring Deficiencies: If recurring deficiencies indicate that the Contractor Quality Control System is not adequate, corrective action shall be taken as directed by the Owner. Progress payments may be withheld until such corrective action has been completed.

1.03 REFERENCE STANDARDS

- A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants 2008 (Reapproved 2014).
- B. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation 2017.
- C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry 2019.
- D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction 2019.
- E. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection 2021.
- F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing 2021.
- G. IAS AC89 - Accreditation Criteria for Testing Laboratories 2018.

1.04 SUBMITTALS

- A. Contractor's Quality Control System/Plan
 - 1. After submitting, and before start of construction, meet with Owner's Representative to discuss the plan. During the meeting, a mutual understanding of the system details shall be developed.
 - 2. Acceptance of the plan is conditional and will be predicated on satisfactory performance during construction. The Owner shall be notified of any changes to the plan, and those changes are subject to review and acceptance by the Owner.
- B. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.
- C. Test Reports: After each test/inspection, promptly submit digital copies of report.
 - 1. Include:
 - a. Date issued.
 - b. Project title and number.

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- c. Name of inspector.
 - d. Date and time of sampling or inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of test/inspection.
 - h. Date of test/inspection.
 - i. Results of test/inspection.
 - j. Conformance with Contract Documents.
 - k. When requested by Architect, provide interpretation of results.
2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.
- D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- E. 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.
- F. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.05 ADDITIONAL REFERENCES AND STANDARDS

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

1.06 TESTING AND INSPECTION AGENCIES

- A. Owner will employ and pay for services of an independent testing agency to perform specified testing unless noted otherwise.
- B. As indicated in individual specification sections, Owner or Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.
- C. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- D. Contractor Employed Agency:
 1. Inspection agency: Comply with requirements of ASTM D3740 and ASTM E329.
 2. Laboratory Qualifications: Accredited by IAS according to IAS AC89.
 3. Laboratory: Authorized to operate in the State of Alaska.
 4. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.

5. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

- A. Contractor's Superintendent shall have a responsibility to identify quality deficiencies in advance of field reviews by Owner's Representative. Superintendent shall also have the authority to direct Contractor's staff and subcontractors to bring deficient work into compliance with the contract requirements. Deficiencies shall be noted in daily reports and tracked on a Deficiency Log updated weekly by the contractor and provided to the owner and Architect.
- B. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- C. Comply with manufacturers' instructions, including each step in sequence.
- D. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- E. 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.
- F. Have Work performed by persons qualified to produce required and specified quality.
- G. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- H. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 TESTING AND INSPECTION

- A. Testing Agency Duties:
 1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 2. Perform specified sampling and testing of products in accordance with specified standards.
 3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 4. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
 5. Perform additional tests and inspections required by Architect or owner's representative.
 6. Submit reports of all tests/inspections specified.
- B. Limits on Testing/Inspection Agency Authority:
 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency may not approve or accept any portion of the Work.
 3. Agency may not assume any duties of Contractor.
 4. Agency has no authority to stop the Work.
- C. Contractor Responsibilities:
 1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.

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- c. To facilitate tests/inspections.
- d. To provide storage and curing of test samples.
- 4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
- 5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- 6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- D. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.
- E. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

3.03 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect 30 days in advance of required observations.
 - 1. Observer subject to approval of Architect.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.04 DEFECT ASSESSMENT

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

END OF SECTION

**SECTION 01 4100
REGULATORY REQUIREMENTS**

PART 1 GENERAL

1.01 SUMMARY

- A. Regulatory requirements applicable to this project are the following:
- B. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines current edition.
- C. 2009 ICC/ANSI A117.1 and IBC Chapter 11 for accessibility.
- D. 29 CFR 1910 - Occupational Safety and Health Standards current edition.
- E. State of Alaska amendments to the following.
- F. ICC (IFC) - International Fire Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. NFPA 101 - Life Safety Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. ICC (IBC) - International Building Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- I. IAPMO (UPC) - Uniform Plumbing Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- J. ICC (IMC) - International Mechanical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- K. NFPA 13 - Standard for the Installation of Sprinkler Systems, 2010.
- L. Mechanical Code: Currently Adopted by the Authority having Jurisdiction.
- M. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- N. ANSI-C2 - National Electric Safety Code.

1.02 RELATED REQUIREMENTS

- A. Section 01 4000 - Quality Requirements.

1.03 QUALITY ASSURANCE

- A. Designer Qualifications: Where delegated engineering design is to be performed under the construction contract provide the direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State of Alaska.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 4216
DEFINITIONS

PART 1 GENERAL

1.01 SUMMARY

- A. This section supplements the definitions contained in the General Conditions.
- B. Other definitions are included in individual specification sections.

1.02 DEFINITIONS

- A. Basic Contract definitions are included in the Conditions of the Contract.
- B. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
- C. Approved: When used to convey Owner's Representative's action on Contractor's submittals, applications, and requests, "Approved" is limited to Owner's Representatives duties and responsibilities as stated in the Conditions of the Contract.
- D. CPM: Critical Path Method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- E. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- F. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
- G. Fragment: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- H. Furnish: To supply, deliver, unload, and inspect for damage.
- I. Indicated: Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- J. Installer: An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.
- K. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.
 - 1. The term "experienced," when used with the term "installer," means having a minimum of 5 previous projects similar in size and scope to the Project, being familiar with the special requirements indicated, and having complied with the requirements of authorities having jurisdiction.
 - 2. Trades: Using the terms such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.
 - 3. Assigning specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However the ultimate responsibility for fulfilling contract requirements remains with the Contractor.
 - a. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.

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- L. Project Site: Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.
- M. Provide: To furnish and install complete and ready for the intended use.
- N. Regulations: Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- O. Supply: Same as Furnish.
- P. Testing Agencies: A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

**SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Temporary utilities.
- B. Temporary telecommunications services.
- C. Temporary sanitary facilities.
- D. Temporary Controls: Barriers, enclosures, and fencing.
- E. Security requirements.
- F. Waste removal facilities and services.
- G. Field offices.

1.02 RELATED REQUIREMENTS

- A. Section 01 5100 - Temporary Utilities.
- B. Section 01 5213 - Field Offices and Sheds.
- C. Section 01 5500 - Vehicular Access and Parking.

1.03 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).

1.04 TEMPORARY UTILITIES

- A. Owner will provide the following:
 - 1. Electrical power and metering, consisting of connection to existing facilities.
 - 2. Water supply, consisting of connection to existing facilities.
- B. Contractor to pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.
- C. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.05 TELECOMMUNICATIONS SERVICES

- A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
- B. Telecommunications services shall include:
 - 1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.
 - 2. Telephone Land Lines: One line, minimum; one handset per line.
 - 3. Internet Connections: Minimum of one.
 - 4. Email: Account/address for project use.
- C. Owner may allow use of existing infrastructure with contractor assuming responsibility for metered use.

1.06 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Use of existing toilet facilities is not permitted for workers.
- C. Maintain daily in clean and sanitary condition.
- D. At end of construction, return facilities to same or better condition as originally found.

1.07 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

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- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.08 EXTERIOR ENCLOSURES

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

1.09 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:

1.10 SECURITY

- A. Provide security and facilities to protect Work, existing facilities, and operations from unauthorized entry, vandalism, or theft.
- B. Contractor is responsible for existing and new facilities for the duration of the project and for the contents of the building when the owner is not physically occupying the building.
- C. Contractor shall provide a minimum of three security cameras with at least 30 days of content available to owner upon request from each camera.
 - 1. Locations to be coordinated with Owner.

1.11 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.
- F. Designate one parking space for Owner and Architect use.

1.12 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 climate controlled 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.
- E. Contractor shall pay for all waste services including landfill fees.

1.13 FIELD OFFICES

- A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.
 - 1. Field office may be located within existing building with approval of owner.
- B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.

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- C. Locate offices in separated temporary buildings a minimum distance of 30 feet from existing and new structures.

1.14 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing and facilities used during construction to original condition.
- D. Restore new permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

**SECTION 01 6000
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. Product interfaces.
- G. Procedures for Owner-supplied products.
- H. Maintenance materials, including extra materials, spare parts, tools, and software.
- I. Section 01 2500 - Substitution Procedures: Substitutions made during and after the Bidding/Negotiation Phase.

1.02 REFERENCE STANDARDS

- A. 16 CFR 260.13 - Guides for the Use of Environmental Marketing Claims; Federal Trade Commission; Recycled Content Current Edition.
- B. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 SUBMITTALS

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

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.
- B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.

2.02 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by the Contract Documents.
- B. DO NOT USE products having any of the following characteristics:
 - 1. Made using or containing CFC's or HCFC's.
 - 2. Made of wood from newly cut old growth timber.
 - 3. Containing lead, cadmium, asbestos.
- C. Where all other criteria are met, Contractor shall give preference to products that:
 - 1. If used on interior, have lower VOC
 - 2. If used on interior, have lower emissions.
 - 3. Result in less construction waste.
 - 4. Are Cradle-to-Cradle Certified.
 - 5. Have a published Health Product Declaration (HPD).
 - 6. Have a published GreenScreen Chemical Hazard Analysis.

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. Submit a request for substitution for any manufacturer not named.

2.04 PRODUCT SELECTION PROCEDURES

- A. Standard Products: If available, and unless custom products or nonstandard options are necessary, provide standard products of types that have been produced and used successfully in similar situations on other projects.
- B. Where products are accompanied by the term 'as selected' , Architect will make selection.
- C. Where products are accompanied by the term ' match sample' The sample to be matched is the Architect's. Architect's decision will be final on whether or not a proposed product matches.

2.05 PRODUCT INTERFACES

- A. Where products of an integrated assembly of materials are provided and installed by different material suppliers and or subcontractors and where one product is attached to another, Contractor shall coordinate entities to ensure a complete and functioning assembly. It is the Contractor's responsibility to fully understand the context in which all products are being installed and constructed.

2.06 MAINTENANCE MATERIALS

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

- A. See Section 01 2500 - Substitution Procedures.
- B. Substitutions **will not** be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

3.02 OWNER-SUPPLIED PRODUCTS

- A. See Section 01 1000 - Summary and Alternates for identification of Owner-supplied products.
- B. Owner's Responsibilities:
 - 1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
 - 2. Arrange and pay for product delivery to site.
 - 3. On delivery, inspect products jointly with Contractor.
 - 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 - 5. Arrange for manufacturers' warranties, inspections, and service.
- C. Contractor's Responsibilities:
 - 1. Review Owner reviewed shop drawings, product data, and samples.
 - 2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
 - 3. Handle, store, install and finish products.
 - 4. Repair or replace items damaged after receipt.

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 weather tight, climate controlled, enclosures in an environment favorable to product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- G. Comply with manufacturer's warranty conditions, if any.
- H. Do not store products directly on the ground.
- I. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- J. Prevent contact with material that may cause corrosion, discoloration, or staining.
- K. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- L. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

**SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 RELATED REQUIREMENTS

- A. Section 01 1000 - Summary and Alternates:
- B. Section 01 3000 - Administrative Requirements: Submittals procedures, Electronic document submittal service.
- C. Section 01 4000 - Quality Requirements: Testing and inspection procedures.
- D. Section 01 5000 - Temporary Facilities and Controls: Temporary exterior enclosures.
- E. Section 01 7900 - Demonstration and Training: Demonstration of products and systems to be commissioned and where indicated in specific specification sections
- F. Section 02 4100 - Demolition: Demolition of whole structures and parts thereof; site utility demolition.
- G. Individual Product Specification Sections:
 - 1. Advance notification to other sections of openings required in work of those sections.
 - 2. Limitations on cutting structural members.

1.03 REFERENCE STANDARDS

- A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations 2019.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
 - 1. On request, submit documentation verifying accuracy of survey work.
 - 2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents.
 - 3. Submit surveys and survey logs for the project record.
- C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
 - 1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences. Include design drawings and calculations for bracing and shoring.
 - 2. Identify demolition firm and submit qualifications.
 - 3. Include a summary of safety procedures.
- D. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather exposed or moisture resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Contractor.
 - 6. Fire or smoke resistant partitions

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

1.05 QUALIFICATIONS

- A. For survey work, employ a land surveyor registered in the State of Alaska and acceptable to Architect. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.
- B. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in the State of Alaska.
- C. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in the State of Alaska.

1.06 PROJECT CONDITIONS

- A. Use of explosives is not permitted.
- B. Grade site to drain. Maintain area free of water. Provide, operate, and maintain pumping equipment if necessary.
- C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- D. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- E. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
 - 1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.
- F. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
- G. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

1.07 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Notify affected utility companies and comply with their requirements.
- C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs. If routing can not be completed as designed, submit a request for additional information before proceeding with alternate routes.
- 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 unless noted otherwise.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Proceed with Work only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.
- E. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- F. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- G. 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.
- H. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
 - 1. Before construction, verify the locations and points of connection of utility services.

3.02 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 - 1. Review conditions of examination, preparation and installation procedures.
 - 2. Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with electronic copies to Architect, Contractor, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.

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- B. Promptly notify Architect of any discrepancies discovered.
- C. Contractor shall locate and protect survey control and reference points.
- D. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- E. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- F. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
- G. Utilize recognized engineering survey practices.
- H. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 - 1. Note that many element locations for the addition are aligned with an existing constructed element. These items shall be verified prior to construction. Contractor to notify Architect of dimensional differences of over 1 inch prior to work for guidance on meeting design intent. These elements are generally indicated in the drawings and include but are not limited to:
 - a. Roof Ridge
 - b. Existing Exterior Soffit
 - c. Existing top of finish floor.
 - d. Existing site grading.
 - e. Existing sidewalks.
 - f. Existing Ceilings and interior soffits.
 - g. Existing doorways.
 - h. Existing columns and beams.
 - i. Existing gridlines.
 - 2. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
 - 3. Grid or axis for structures.
 - 4. Building foundation, column locations, ground floor elevations, and existing soffit elevations..
- I. Periodically verify layouts by same means.
- J. Maintain a complete and accurate log of control and survey work as it progresses.

3.05 GENERAL INSTALLATION REQUIREMENTS

- A. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.
- B. 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.
- C. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- D. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- E. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- F. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.

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1. Provide, erect, and maintain temporary dustproof partitions of construction as required to protect adjacent areas of the building .
- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
 1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
 2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.
- D. Remove existing work as indicated and as required to accomplish new work.
 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
 2. Remove items indicated on drawings.
 3. Relocate items indicated on drawings.
 4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
 5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
 2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
 3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
 4. Verify that abandoned services serve only abandoned facilities.
 5. Remove abandoned pipe, ducts, conduits, and equipment , including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.
- F. Protect existing work to remain.
 1. Prevent movement of structure; provide shoring and bracing if necessary.
 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 3. Repair adjacent construction and finishes damaged during removal work.
- G. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
- H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- I. Refinish existing surfaces as indicated:
 1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
 2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
- J. Clean existing systems and equipment.
- K. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

- L. Do not begin new construction in alterations areas before demolition is complete.
- M. Comply with all other applicable requirements of this section.

3.07 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. See Alterations article above for additional requirements.
- C. Perform whatever cutting and patching is necessary to:
 - 1. Complete the work.
 - 2. Fit products together to integrate with other work.
 - 3. Provide openings for penetration of mechanical, electrical, and other services.
 - 4. Match work that has been cut to adjacent work.
 - 5. Repair areas adjacent to cuts to required condition.
 - 6. Repair new work damaged by subsequent work.
 - 7. Remove samples of installed work for testing when requested.
 - 8. Remove and replace defective and non-conforming work.
- D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- E. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- G. Restore work with new products in accordance with requirements of Contract Documents.
- H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material, to full thickness of the penetrated element. Provide UL rated assembly detail.
- J. Patching:
 - 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 - 2. Match color, texture, and appearance.
 - 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.08 PROGRESS CLEANING

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

3.09 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

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- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Protect work from spilled liquids. If work is exposed to spilled liquids, immediately remove protective coverings, dry out work, and replace protective coverings.
- G. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- H. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.10 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Replace defective parts.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace chipped, scratched, or broken glass or reflective surfaces.
- D. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

3.11 SYSTEM STARTUP

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect and owner seven days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Submit a written report signed by installer and general contractor that equipment or system has been properly installed and is functioning correctly.

3.12 DEMONSTRATION AND INSTRUCTION

- A. See Section 01 7900 - Demonstration and Training.

3.13 ADJUSTING

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

3.14 FINAL CLEANING

- A. Execute final cleaning prior to final project assessment.
 - 1. Clean all areas to be occupied by Owner prior to final completion before Owner occupancy including existing and new spaces.
- 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.

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- 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 all Ductwork inside and out.
- H. Clean debris from roofs and drainage systems.
- I. Clean site; sweep paved areas, rake clean landscaped surfaces.
- J. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.
- K. Clean all areas of of the building from any dust, dirt or debris this includes areas of the building not directly affected by the construction.

3.15 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
 - 1. Provide pdf copies to Owner.
 - 2. Provide pdf copies to Architect.
 - 3. See Section 01 78 00 For Closeout Submittal requirements.
- B. Notify Owner's Representative when work is considered ready for Architect's Substantial Completion inspection.
- C. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.
- D. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Owner's Representative.
- E. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
- F. Notify Owner's Representative when work is considered finally complete and ready for Architect's final inspection.

3.16 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 7419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL**

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

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

1.02 RELATED REQUIREMENTS

- A. Section 01 3000 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.
- B. Section 01 5000 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.
- C. Section 01 6000 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.
- D. Section 01 7000 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

1.03 DEFINITIONS

- A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
- B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.
- C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.
- D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
- E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
- F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

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- H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- I. Return: To give back reusable items or unused products to vendors for credit.
- J. Reuse: To reuse a construction waste material in some manner on the project site.
- K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
- M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- N. Toxic: Poisonous to humans either immediately or after a long period of exposure.
- O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Waste Management Plan: Include the following information:
 - 1. Analysis of the trash and waste projected to be generated during the entire project construction cycle, including types and quantities.
 - 2. Landfill Options: The name, address, and telephone number of the landfill(s) where trash/waste will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all project trash/waste in the landfill(s).
 - 3. Landfill Alternatives: List all waste materials that will be diverted from landfills by reuse, salvage, or recycling.
 - 4. Meetings: Describe regular meetings to be held to address waste prevention, reduction, recycling, salvage, reuse, and disposal.
 - 5. Materials Handling Procedures: Describe the means by which materials to be diverted from landfills will be protected from contamination and prepared for acceptance by designated facilities; include separation procedures for recyclables, storage, and packaging.
 - 6. Transportation: Identify the destination and means of transportation of materials to be recycled; i.e. whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler.

PART 2 PRODUCTS

2.01 PRODUCT SUBSTITUTIONS

- A. See Section 01 6000 - Product Requirements for substitution submission procedures.
- B. For each proposed product substitution, submit the following information in addition to requirements specified in Section 01 6000:
 - 1. Relative amount of waste produced, compared to specified product.
 - 2. Cost savings on waste disposal, compared to specified product, to be deducted from the Contract Price.
 - 3. Proposed disposal method for waste product.
 - 4. Markets for recycled waste product.

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PLAN IMPLEMENTATION

- A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.
- B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.

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- C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.
- D. Meetings: Discuss trash/waste management goals and issues at project meetings.
 - 1. Prebid meeting.
 - 2. Preconstruction meeting.
 - 3. Regular job-site meetings.
- E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
 - 1. Provide containers as required.
 - 2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
 - 3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
- F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
- G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.
- H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.
- I. Salvage: Set aside, sort, and protect products to be salvaged for reuse.
 - 1. If owner has declined to keep salvaged items, the contractor shall dispose of and remove from site.
 - a. Contractor may not store items identified for disposal on site nor may there be selling or advertisement for sale of such items directly from the project site by contractor.

END OF SECTION

**SECTION 01 7800
CLOSEOUT SUBMITTALS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Project Record Documents.
- B. Operation and Maintenance Data.
- C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

- A. Section 00 7200 - General Conditions and 00 7300 - Supplementary Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
- B. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- C. Section 01 7000 - Execution and Closeout Requirements: Contract closeout procedures.
- D. Individual Product Sections: Specific requirements for operation and maintenance data.
- E. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

- A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
- B. Operation and Maintenance Data:
 - 1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
 - 2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
 - 3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
 - 4. Submit two sets of revised final documents and one bookmarked and searchable digital .pdf in final form within 10 days after final inspection.
- C. Warranties and Bonds:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
 - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed submittals, shop drawings, product data, and samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.

- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 3. Field changes of dimension and detail.
 - 4. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

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

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- A. For Each Product, Applied Material, and Finish:
 - 1. Product data, with catalog number, size, composition, and color and texture designations.
 - 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.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System:
 - 1. Description of unit or system, and component parts.
 - 2. Identify function, normal operating characteristics, and limiting conditions.
 - 3. Include performance curves, with engineering data and tests.
 - 4. Complete nomenclature and model number of replaceable parts.
- B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- D. 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.

- E. 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.
- F. Provide servicing and lubrication schedule, and list of lubricants required.
- G. Include manufacturer's printed operation and maintenance instructions.
- H. Include sequence of operation by controls manufacturer.
- I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

- A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
- B. Where systems involve more than one specification section, provide separate tabbed divider for each system.
- C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- D. Digital pdf: Provide bookmarked and searchable digital .pdf in the same format and order as the hardcopy. Delivery format can be DVD-rom or USB Flash Drive.
- E. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- F. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.
- G. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
- H. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
- I. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.
- J. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- K. Arrangement of Contents: Organize each volume in parts as follows:
 - 1. Project Directory.
 - 2. Table of Contents, of all volumes, and of this volume.
 - 3. Operation and Maintenance Data: Arranged by system, then by product category.
 - a. Source data.
 - b. Product data, shop drawings, and other submittals.
 - c. Operation and maintenance data.
 - d. Field quality control data.
 - e. Photocopies of warranties and bonds.

3.06 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.

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- D. Retain warranties and bonds until time specified for submittal.

END OF SECTION

**SECTION 01 7900
DEMONSTRATION AND TRAINING**

PART 1 GENERAL

1.01 SUMMARY

- A. Demonstration of products and systems where indicated in specific specification sections.
- B. Training of Owner personnel in operation and maintenance is required for:
 - 1. All software-operated systems.
 - 2. HVAC systems and equipment.
 - 3. Plumbing equipment.
 - 4. Electrical systems and equipment.
 - 5. Items specified in individual product Sections.
- C. Training of Owner personnel in care, cleaning, maintenance, and repair is required for:
 - 1. Roofing, waterproofing, and other weather-exposed or moisture protection products.
 - 2. Finishes, Fixtures and other items specified in individual product Sections including but not limited to the following:
 - a. Exterior Finishes
 - b. Exterior sealants.
 - c. Weeps and drainage channels in window and door systems.
 - d. Interior Accessories including Window Shades and Access hatches.
 - e. Interior Finishes

1.02 RELATED REQUIREMENTS

- A. Section 01 7800 - Closeout Submittals: Operation and maintenance manuals.
- B. Other Specification Sections: Additional requirements for demonstration and training.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Training Plan: Owner will designate personnel to be trained; tailor training to needs and skill-level of attendees.
 - 1. Submit to Architect for transmittal to Owner.
 - 2. Submit not less than four weeks prior to start of training.
 - 3. Provide an overall schedule showing all training sessions.
 - 4. Include at least the following for each training session:
 - a. Identification, date, time, and duration.
 - b. Description of products and/or systems to be covered.
- C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
 - 1. Include applicable portion of O&M manuals.
 - 2. Include paper and digital .pdf copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
 - 3. Provide one extra copy of each training manual to be included with operation and maintenance data.
- D. Training Reports:
 - 1. Identification of each training session, date, time, and duration.
 - 2. Sign-in sheet showing names and job titles of attendees.
 - 3. List of attendee questions and written answers given, including copies of and references to supporting documentation required for clarification; include answers to questions that could not be answered in original training session.
- E. Video Recordings: Submit digital video recording of each demonstration and training session for Owner's subsequent use.
 - 1. Format: DVD Disc or USB Flash Drive.
 - 2. Label each disc and container with session identification and date.

1.04 QUALITY ASSURANCE

- A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.

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1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 DEMONSTRATION - GENERAL

- A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.
- B. Demonstration may be combined with Owner personnel training if applicable.
- C. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
 1. Perform demonstrations not less than two weeks prior to Substantial Completion.
 2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- D. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
 1. Perform demonstrations not less than two weeks prior to Substantial Completion.

3.02 TRAINING - GENERAL

- A. Conduct training on-site unless otherwise indicated.
- B. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.
- C. Review of Facility Policy on Operation and Maintenance Data: During training discuss:
 1. The location of the O&M manuals and procedures for use and preservation; backup copies.
 2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
 3. Typical uses of the O&M manuals.
- D. Product- and System-Specific Training:
 1. Review the applicable O&M manuals.
 2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
 3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
 4. Provide hands-on training on all operational modes possible and preventive maintenance.
 5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
 6. Discuss common troubleshooting problems and solutions.
 7. Discuss any peculiarities of equipment installation or operation.
 8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
 9. Review recommended tools and spare parts inventory suggestions of manufacturers.
 10. Review spare parts and tools required to be furnished by Contractor.
 11. Review spare parts suppliers and sources and procurement procedures.
- E. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION

**SECTION 02 4100
DEMOLITION**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Selective demolition of built site elements.
- B. Selective demolition of building including structural elements for alteration purposes.
- C. Selective demolition of utility elements.
- D. Salvage of existing items to reused or recycled.

1.02 RELATED REQUIREMENTS

- A. Section 00 3100 - Available Project Information: Existing building original construction drawings, current survey and geotec.
- B. Section 01 1000 - Summary and Alternates: Limitations on Contractor's use of site and premises.
- C. Section 01 1000 - Summary and Alternates: Description of items to be salvaged or removed for re-use by Contractor.
- D. Section 01 5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
- E. Section 01 6000 - Product Requirements: Handling and storage of items removed for salvage and relocation.
- F. Section 01 7000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.
- G. Section 01 7419 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.
- H. Section 07 0150.19 - Preparation for Re-Roofing: Removal of existing roofing, roof insulation, flashing, trim, and accessories.
- I. Section 31 1000 - Site Clearing: Site clearing and removal of above- and below-grade improvements not part of selective demolition.
- J. Section 31 2323 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

1.03 REFERENCE STANDARDS

- A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards current edition.
- B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations 2013.

1.04 DEFINITIONS

- A. Remove (also labeled Demo or Demolish on plans): Detach items from existing construction and legally dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse or store as directed by the Owner.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Site Plan: Showing:
 - 1. Areas for temporary construction and field offices.
- C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
 - 1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
 - 2. Identify demolition firm and submit qualifications.
 - 3. Include a summary of safety procedures.
 - 4. Include details on sequence of work and protection of building interior during demolition.

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

1.06 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
 - 1. Before selective demolition, Owner will remove the following items:
 - a. COORDINATE WITH ARCHITECT/OWNER
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the Work.
 - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.07 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Company specializing in the type of work required.
 - 1. Minimum of 5 years of documented experience.

1.08 COORDINATION

- A. Arrange demolition schedule so as not to interfere with Owner's operations.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with the following:
 - 1. ANSI/ASSP A10.6 – Safety and Health Requirements for Demolition Operations.
 - 2. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

2.02 SOIL MATERIALS

- A. Satisfactory Soils: Comply with requirements in Section 312000 "Earth Moving."
 - 1. Fill Material: As specified in Section 31 2323 - Fill.

PART 3 EXECUTION

3.01 SCOPE

- A. Remove portions of the existing building as indicated and as required to prepare for new work.
- B. Remove paving and curbs as required to accomplish new work.
- C. Remove other items indicated.
- D. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified by civil engineer.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

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

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1. Obtain required permits.
 2. Comply with applicable requirements of NFPA 241.
 3. Use of explosives is not permitted.
 4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 5. Provide, erect, and maintain temporary barriers and security devices.
 6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
 7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 8. Do not close or obstruct roadways or sidewalks without permit.
 9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
 10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- B. Do not begin removal until receipt of notification to proceed from Owner.
- C. Protect existing structures and other elements that are not to be removed.
1. Provide bracing and shoring.
- D. 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.
- E. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.
- F. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video.
1. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.

3.04 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 2. Arrange to shut off utilities with utility companies. – VERIFY PREFERENCE WITH OWNER
 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.

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- b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
- C. Equipment to Be Removed: Disconnect and cap services and remove equipment.
- D. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
- E. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
- F. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
- G. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.05 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.06 SELECTIVE DEMOLITION, GENERAL

- A. Drawings showing existing construction and utilities are based on casual observation and original construction drawings.
 - 1. Verify that construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
 - 4. Separate areas in which demolition is being conducted from other areas that are still occupied with furnishings or finishes to remain.
 - 5. Provide, erect, and maintain temporary dustproof partitions during construction.
- B. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 5. Maintain fire watch during and for at least hours after flame-cutting operations.
 6. Maintain adequate ventilation when using cutting torches.
 7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 10. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 "Construction Waste Management and Disposal."
- C. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
 2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
- D. Removed and Salvaged Items:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area as designated by Owner.
 5. Protect items from damage during transport and storage.
- E. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- F. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition[and cleaned] and reinstalled in their original locations after selective demolition operations are complete.
- G. Below-Grade Construction: Abandon foundation walls and other below-grade construction. Cut below-grade construction flush with grade.
- H. Existing Utilities: Abandon existing utilities and below-grade utility structures. Cut utilities flush with grade
- I. Explosives: Use of explosives is not permitted.

3.07 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
- B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.

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- C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.
- D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." [Do not use methods requiring solvent-based adhesive strippers.]
- E. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight. See Section for new roofing requirements.
 - 1. Remove existing roof membrane, flashings, copings, and roof accessories.
 - 2. Remove existing roofing system down to substrate.

3.08 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.

3.09 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.
 - 1. Clean roadways of debris caused by debris transport.

3.10 REPAIRS

- A. Promptly repair damage to adjacent buildings, roadways, and any site elements caused by demolition operations.

3.11 SELECTIVE DEMOLITION SCHEDULE – COORDINATE WITH ARCHITECT/OWNER

- A. Remove: .
- B. Remove and Salvage: .
- C. Remove and Reinstall: .
- D. Existing to Remain: .
- E. Dismantle: .

3.12 SELECTIVE DEMOLITION FOR ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
- B. Separate areas in which demolition is being conducted from other areas that are still occupied with furnishings or finishes to remain.
 - 1. Provide, erect, and maintain temporary dustproof partitions during construction.
- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
 - 1. Coordinate interruptions with weather forecast.
 - a. It is the responsibility of the contractor to provide weatherproof enclosure and protect interior of the building from damage regardless of the weather.

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- D. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove items indicated on drawings.
- E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
 - 1. Verify that abandoned services serve only abandoned facilities before removal.
 - 2. 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.
 - 3. See Mechanical and Electrical Division for additional information.
- F. Protect existing work to remain.
 - 1. Prevent movement of structure; provide shoring and bracing if necessary.
 - 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during removal work.
 - 4. Patch as specified for patching new work.

3.13 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Remove from site all materials not to be reused on site; comply with requirements of Section 01 7419 - Waste Management.
- C. Leave site in clean condition, ready for subsequent work.
- D. Clean up spillage and wind-blown debris from jobsite and public and private lands.

END OF SECTION

**SECTION 03 0516
UNDERSLAB VAPOR RETARDER**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sheet vapor retarder under concrete slabs on grade.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Preparation of subgrade, granular fill, placement of concrete.

1.03 REFERENCE STANDARDS

- A. ASTM E-96 Water Vapor Permeance
- B. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs 2011 (Reapproved 2017).
- C. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs 2017.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products.
- C. Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent construction.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Underslab Vapor retarder: Vaport Barrier-3
 - 1. Water Vapor Permeance: Not more than 0.010 perms, maximum.
 - 2. Thickness: 15 mils.
 - 3. Basis of Design:
 - a. WR Meadows Perminator 15 mil
 - b. Stego Industries LLC; Stego Wrap Vapor retarder (15-mil): www.stegoindustries.com/#sle.
- B. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, etc., for sealing seams and penetrations in vapor retarder.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surface over which vapor retarder is to be installed is complete and ready before proceeding with installation of vapor retarder.

3.02 INSTALLATION

- A. Install vapor retarder in accordance with manufacturer's instructions and ASTM E1643.
- B. Install vapor retarder under interior slabs on grade; lap sheet over footings and seal to foundation walls.
- C. Lap joints minimum 6 inches.
- D. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions.
- E. No penetration of vapor retarder is allowed except for reinforcing steel and permanent utilities.
- F. Repair damaged vapor retarder before covering with other materials.

END OF SECTION

SECTION 03 3000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.
- B. Related Requirements:
 - 1. Section 03 0516 – UNDERSLAB VAPOR BARRIER.
 - 2. Section 07 2100 for Underslab insulation and perimeter foundation insulation.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Welding certificates.
- C. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Steel reinforcement and accessories.
 - 4. Floor and slab treatments.
 - 5. Vapor retarders.
- D. Material Test Reports: For the following, from a qualified testing agency:
 - 1. Aggregates.
- E. Field quality-control reports.
- F. Minutes of preinstallation conference.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

1.8 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on concrete mixtures.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

1.10 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.

2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 301.
 2. ACI 117.

2.2 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
1. Plywood, metal, or other approved panel materials.
 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1 or better.
 - b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
 - c. Structural 1, B-B or better; mill oiled and edge sealed.
 - d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- D. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- E. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- F. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- G. Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

2.4 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

2.5 CONCRETE MATERIALS

- A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- B. Cementitious Materials:
 - 1. Portland Cement: ASTM C 150/C 150M, Type I,.
- C. Normal-Weight Aggregates: ASTM C 33/C 33M, coarse aggregate or better, graded. Provide aggregates from a single source.
 - 1. Maximum Coarse-Aggregate Size: 1 inch nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Air-Entraining Admixture: ASTM C 260/C 260M.
- E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
- F. Water: ASTM C 94/C 94M and potable.

2.6 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

2.7 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Bonding Agent: ASTM C 1059/C 1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

2.8 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
 - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- C. Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. Use water-reducing or high-range water-reducing admixture in concrete, as required, for placement and workability.
 - 2. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs, concrete required to be watertight, and concrete with a w/c ratio below 0.50.
 - 3. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.9 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings, foundation walls, piers, exterior flatwork: Normal-weight concrete.
 - 1. Minimum Compressive Strength: 4000 psi at 28 days.
 - 2. Maximum W/C Ratio: 0.45.
 - 3. Slump Limit: 4 inches, plus or minus 1 inch.
 - 4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1-inch nominal maximum aggregate size.
- B. Interior slabs-on-Grade: Normal-weight concrete.
 - 1. Minimum Compressive Strength: 4000 psi at 28 days.
 - 2. Maximum W/C Ratio: 0.45.
 - 3. Slump Limit: 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
 - 4. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

2.10 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.11 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Construct forms tight enough to prevent loss of concrete mortar.
- D. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install keyways, reglets, recesses, and the like, for easy removal.
 - 2. Do not use rust-stained steel form-facing material.
- E. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- F. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- G. Chamfer exterior corners and edges of permanently exposed concrete.
- H. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- I. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- J. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- K. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEM INSTALLATION

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.

3.3 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

3.4 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 2. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 3. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.

2. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.5 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301, including slabs.
 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
1. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 2. Maintain reinforcement in position on chairs during concrete placement.
 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 4. Slope surfaces uniformly to drains where required. Provide clearance to account for floor covering thickness.
 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

3.6 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.
- C. Rubbed Finish: Apply the following to smooth-formed-finished as-cast concrete where indicated:
 - 1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.7 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch in one direction.
 - 1. Apply scratch finish to surfaces indicated and to receive mortar setting beds for bonded cementitious floor finishes.
- C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture.
 - 1. Apply float finish to surfaces to receive trowel finish.
- D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
 2. Finish and measure surface, so gap at any point between concrete surface and an unlevelled, freestanding, 10-ft.- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/4 inch.
- E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thinset method. While concrete is still plastic, slightly scarify surface with a fine broom.
1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.
- G. Do not add water to surface to aid in finishing.

3.8 MISCELLANEOUS CONCRETE ITEM INSTALLATION

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

3.9 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 305.1 for hot-weather protection during curing.
- B. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies does not interfere with bonding of floor covering used on Project.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.

3.10 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 1. Defer joint filling until concrete has aged at least one month(s). Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.11 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding

- agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar matches surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 2. After concrete has cured at least 14 days, correct high areas by grinding.
 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.12 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare test reports.

- B. Testing Agency: A qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Inspections:
1. Steel reinforcement placement.
 2. Verification of use of required design mixture.
 3. Concrete placement, including conveying and depositing.
 4. Curing procedures and maintenance of curing temperature.
- D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:
1. Testing Frequency: One composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Additional tests will be performed when concrete consistency appears to change.
 3. Air Content: ASTM C 231/C 231M, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
 5. Unit Weight: ASTM C 567/C 567M, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 6. Compression Test Specimens: ASTM C 31/C 31M.
 - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
 7. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
 - a. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
 8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
 9. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
 10. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
 11. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

12. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
 13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 14. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- E. Measure floor and slab flatness and levelness according to ASTM E 1155 within 24 hours of finishing.

END OF SECTION 03 3000

SECTION 05 1200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Structural steel.
 - 2. Grout.

1.3 DEFINITIONS

- A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
- B. Seismic-Load-Resisting System: Elements of structural-steel frame designated as "SLRS" or along grid lines designated as "SLRS" on Drawings, including columns, beams, and braces and their connections.
- C. Protected Zone: Structural members or portions of structural members indicated as "Protected Zone" on Drawings. Connections of structural and nonstructural elements to protected zones are limited.
- D. Demand Critical Welds: Those welds, the failure of which would result in significant degradation of the strength and stiffness of the Seismic-Load-Resisting System and which are indicated as "Demand Critical" or "Seismic Critical" on Drawings.

1.4 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show fabrication of structural-steel components.
 - 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 - 2. Include embedment Drawings.
 - 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
 - 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.
 - 5. Identify members and connections of the Seismic-Load-Resisting System.
 - 6. Indicate locations and dimensions of protected zones.
 - 7. Identify demand critical welds.
- C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint qualified by testing, including the following:
 - 1. Power source (constant current or constant voltage).
 - 2. Electrode manufacturer and trade name, for demand critical welds.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, fabricator, testing agency.
- B. Welding certificates.
- C. Mill test reports for structural steel, including chemical and physical properties.
- D. Product Test Reports: For the following:
 - 1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
 - 2. Direct-tension indicators.
 - 3. Tension-control, high-strength, bolt-nut-washer assemblies.
 - 4. Shop primers.
 - 5. Nonshrink grout.
- E. Source quality-control reports.

1.8 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by

AWS D1.8/D1.8M. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.

- C. Comply with applicable provisions of the following specifications and documents:
1. AISC 303.
 2. AISC 341 and AISC 341s1.
 3. AISC 360.
 4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A 992/A 992M.
- B. Channels, Angles, M , S-Shapes: ASTM A 36/A 36M.
- C. Brace Gusset Plates: ASTM A 572/A 572M, Grade 50.
- D. All other Plate and Bar: ASTM A 36/A 36M.
- E. Cold-Formed Hollow Structural Sections: ASTM A 500/A 500M, Grade B, structural tubing.
- F. Steel Pipe: ASTM A 53/A 53M, Type E or Type S, Grade B.
- G. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.

1. Direct-Tension Indicators: ASTM F 959, Type 325, compressible-washer type with plain finish.
- B. Zinc-Coated High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade DH heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers.
 1. Finish: Hot-dip or mechanically deposited zinc coating.
 2. Direct-Tension Indicators: ASTM F 959, Type 325, compressible-washer type with mechanically deposited zinc coating finish.
- C. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.
 1. Finish: Plain.
- D. Unheaded Anchor Rods: ASTM F 1554, Grade 36.
 1. Configuration: Straight.
 2. Nuts: ASTM A 563 heavy-hex carbon steel.
 3. Plate Washers: ASTM A 36/A 36M carbon steel.
 4. Washers: ASTM F 436, Type 1, hardened carbon steel.
 5. Finish: Plain or Hot-dip zinc coating, ASTM A 153/A 153M, Class C at galvanized steel locations.

2.3 PRIMER

- A. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.
- B. Galvanizing Repair Paint: ASTM A 780/A 780M.

2.4 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.
 1. Camber structural-steel members where indicated.
 2. Fabricate beams with rolling camber up.
 3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
 4. Mark and match-mark materials for field assembly.
 5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
 - 1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
 - 1. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 3, "Power Tool Cleaning."
- E. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.
 - 1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
 - 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
 - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.6 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug tightened or Pretensioned where indicated.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.7 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
 - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
 - 2. Surfaces to be field welded.
 - 3. Surfaces of high-strength bolted, slip-critical connections.
 - 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
 - 5. Galvanized surfaces.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
 - 1. SSPC-SP 3, "Power Tool Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

2.8 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.
 1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
 2. Galvanize all steel permanently exposed to weather or in unconditioned areas external to the structure.

2.9 SOURCE QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform shop tests and inspections.
 1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
- B. Bolted Connections: Inspect shop-bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Visually inspect shop-welded connections according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 1. Liquid Penetrant Inspection: ASTM E 165.
 2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 3. Ultrasonic Inspection: ASTM E 164.
 4. Radiographic Inspection: ASTM E 94.
- D. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete-surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
 1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Baseplates Bearing Plates and Leveling Plates: Clean concrete-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 - 3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure.
 - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.4 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug tightened or Pretensioned as indicated.
- B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," for mill material.

3.5 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 1. Verify structural-steel materials and inspect steel frame joint details.
 2. Verify weld materials and inspect welds.
 3. Verify connection materials and inspect high-strength bolted connections.
- B. Bolted Connections: Inspect and test bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.
 1. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - c. Ultrasonic Inspection: ASTM E 164.
 - d. Radiographic Inspection: ASTM E 94.

3.6 REPAIRS AND PROTECTION

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780/A 780M.
- B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

END OF SECTION 05 1200

SECTION 05 2100 - STEEL JOIST FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. K-series steel joists.
 - 2. KCS-type K-series steel joists.
 - 3. Joist accessories.

1.3 DEFINITIONS

- A. SJI's "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."
- B. Special Joists: Steel joists or joist girders requiring modification by manufacturer to support nonuniform, unequal, or special loading conditions that invalidate load tables in SJI's "Specifications."

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of joist, accessory, and product.
- B. Shop Drawings:
 - 1. Include layout, designation, number, type, location, and spacing of joists.
 - 2. Include joining and anchorage details; bracing, bridging, and joist accessories; splice and connection locations and details; and attachments to other construction.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Welding certificates.
- C. Manufacturer certificates.
- D. Mill Certificates: For each type of bolt.
- E. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables in SJI's "Specifications."
- B. Welding Qualifications: Qualify field-welding procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle joists as recommended in SJI's "Specifications."
- B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

PART 2 - PRODUCTS

2.1 K-SERIES STEEL JOISTS

- A. Manufacture steel joists of type indicated according to "Standard Specification for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.
 - 1. Joist Type: K-series steel joists and KCS-type K-series steel joists.
- B. Steel Joist Substitutes: Manufacture according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or -channel members.
- C. Provide holes in chord members for connecting and securing other construction to joists.
- D. Top-Chord Extensions: Extend top chords of joists with SJI's Type S top-chord extensions where indicated, complying with SJI's "Specifications."
- E. Extended Ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated, complying with SJI's "Specifications."
- F. Do not camber joists.
- G. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches.

2.2 PRIMERS

- A. Primer: SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

2.3 JOIST ACCESSORIES

- A. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.
- B. Furnish ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within 1/2 inch of finished wall surface unless otherwise indicated.
- C. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy hex steel structural bolts; ASTM A 563 heavy hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.
 - 1. Finish: Plain.
- D. Welding Electrodes: Comply with AWS standards.
- E. Furnish miscellaneous accessories including splice plates and bolts required by joist manufacturer to complete joist assembly.

2.4 CLEANING AND SHOP PAINTING

- A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2 or power-tool cleaning, SSPC-SP 3.
- B. Do not prime paint joists and accessories to receive sprayed fire-resistive materials.
- C. Apply one coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting substrates, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Do not install joists until supporting construction is in place and secured.
- B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written instructions, and requirements in this Section.
 - 1. Before installation, splice joists delivered to Project site in more than one piece.
 - 2. Space, adjust, and align joists accurately in location before permanently fastening.

3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
- C. Field weld joists to supporting steel and framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
- D. Bolt joists to supporting steel framework using carbon-steel bolts.
- E. Bolt joists to supporting steel framework using high-strength structural bolts. Comply with RCSC's "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts" for high-strength structural bolt installation and tightening requirements.
- F. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Visually inspect field welds according to AWS D1.1/D1.1M.
- C. Visually inspect bolted connections.
- D. Prepare test and inspection reports.

3.4 PROTECTION

- A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.
- B. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists abutting structural steel, and accessories.
 1. Clean and prepare surfaces by hand-tool cleaning according to SSPC-SP 2 or power-tool cleaning according to SSPC-SP 3.
 2. Apply a compatible primer of same type as primer used on adjacent surfaces.

END OF SECTION 05 2100

SECTION 05 3100 - STEEL DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Roof deck.
 - 2. Overframing roof deck

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of deck, accessory, and product indicated.
- B. Shop Drawings:
 - 1. Include layout and types of deck panels, anchorage details, reinforcing channels, cut deck openings, special jointing, accessories, and attachments to other construction.

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Product Certificates: For each type of steel deck.
- C. Product Test Reports: For tests performed by a qualified testing agency, indicating that each of the following complies with requirements:
 - 1. Power-actuated mechanical fasteners.
 - 2. Acoustical roof deck.
 - 3. Screws.
- D. Evaluation Reports: For steel deck, from ICC-ES.
- E. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

- C. Electrical Raceway Units: Provide UL-labeled cellular floor-deck units complying with UL 209 and listed in UL's "Electrical Construction Equipment Directory" for use with standard header ducts and outlets for electrical distribution systems.
- D. FM Global Listing: Provide steel roof deck evaluated by FM Global and listed in its "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
 - 1. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.

PART 2 - PRODUCTS

2.1 ROOF DECK

- A. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:
 - 1. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33, G60 zinc coating.
 - 2. Deck Profile: As indicated.
 - 3. Profile Depth: 1-1/2 inches.
 - 4. Design Uncoated-Steel Thickness: As required to meet design loads indicated; minimum 0.0358 inch.

2.2 OVERFRAMING ROOF DECK

- A. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:
 - 1. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33, G60 zinc coating.
 - 2. Deck Profile: As indicated.
 - 3. Profile Depth: 3 inches.
 - 4. Design Uncoated-Steel Thickness: As required to meet design loads indicated; minimum 0.0295 inch.

2.3 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- F. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.
- G. Piercing Hanger Tabs: Piercing steel sheet hanger attachment devices for use with floor deck.
- H. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.
- B. Install temporary shoring before placing deck panels if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
 - 1. Align cellular deck panels over full length of cell runs and align cells at ends of abutting panels.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.

- H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

3.3 ROOF-DECK INSTALLATION

- A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches long, and as follows:
 - 1. Weld Diameter: 5/8 inch, nominal. Attachment pattern as required for indicated loading.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals required to meet the indicated loading:
 - 1. Mechanically fasten with self-drilling, No. 10 diameter or larger, carbon-steel screws.
 - 2. Mechanically clinch or button punch.
 - 3. Fasten with a minimum of 1-1/2-inch- long welds.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:
 - 1. End Joints: Lapped 2 inches minimum or butted at Contractor's option.
- D. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation.
 - 1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.
- E. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Field welds will be subject to inspection.

3.5 PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.

END OF SECTION 05 3100

SECTION 05 4000 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 1. Exterior non-load-bearing wall framing.
 2. Soffit framing.
 3. Overframing / bearing walls.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings:
 1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
 2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Welding certificates.
- C. Product Certificates: For each type of code-compliance certification for studs and tracks.
- D. Evaluation Reports: For nonstandard cold-formed steel framing, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

- B. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Certified Steel Stud Association the Steel Framing Industry Association or the Steel Stud Manufacturers Association.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

PART 2 - PRODUCTS

2.1 COLD-FORMED STEEL FRAMING MATERIALS

- A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:
 - 1. Grade: As required by structural performance.
 - 2. Coating: G60, A60, AZ50, or GF30.
- B. Steel Sheet for Vertical Deflection Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
 - 1. Grade: As required by structural performance.
 - 2. Coating: G60.

2.2 EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.0428 inch minimum.
 - 2. Flange Width: 1 5/8 inches minimum.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: Matching steel studs.
 - 2. Flange Width: 1-1/4 inches.
- C. Vertical Deflection Clips: Manufacturer's standard bypass clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
- D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.0428 inch.
 - 2. Flange Width: 1 inch plus the design gap for one-story structures.

- E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
 - 1. Outer Track: Of web depth to allow free vertical movement of inner track, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:
 - a. Minimum Base-Metal Thickness: 0.0428 inch.
 - b. Flange Width: 1 inch plus the design gap for one-story structures.
 - 2. Inner Track: Of web depth indicated, and as follows:
 - a. Minimum Base-Metal Thickness: 0.0428 inch.
 - b. Flange Width: 2 inch.
- F. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

2.3 SOFFIT FRAMING

- A. Exterior Soffit Frame: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.0428 inch minimum.
 - 2. Flange Width: 1 5/8 inches, minimum.
 - 3. Coating: G60

2.4 OVERFRAMING / LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.0329 inch.
 - 2. Flange Width: 1-3/8 inches.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with straight flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.0329 inch.
 - 2. Flange Width: 1-1/4 inches.

2.5 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
 - 1. Supplementary framing.
 - 2. Bracing, bridging, and solid blocking.

3. Web stiffeners.
4. Anchor clips.
5. End clips.
6. Foundation clips.
7. Stud kickers and knee braces.

2.6 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.
- B. Power-Actuated Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- C. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.
 1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.
- D. Welding Electrodes: Comply with AWS standards.

2.7 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: ASTM A 780/A 780M.
- B. Shims: Load-bearing, high-density, multimonomer, nonleaching plastic; or cold-formed steel of same grade and metallic coating as framing members supported by shims.
- C. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members as required.

2.8 FABRICATION

- A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
 1. Fabricate framing assemblies using jigs or templates.
 2. Cut framing members by sawing or shearing; do not torch cut.
 3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, with screws penetrating joined members by no fewer than three exposed screw threads.
 4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.

- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies by means that prevent damage or permanent distortion.
- C. Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable variation of 1/8 inch in 10 feet and as follows:
 - 1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
 - 2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of 1/8 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, conditions, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Install load-bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than 1/4 inch to ensure a uniform bearing surface on supporting concrete or masonry construction.
- B. Install sealer gaskets at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

- A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed steel framing according to AISI S200, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
 - 1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch.
- D. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
 - 1. Cut framing members by sawing or shearing; do not torch cut.
 - 2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.

- a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners, install according to Shop Drawings, and comply with requirements for spacing, edge distances, and screw penetration.
- E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- F. Install temporary bracing and supports to secure framing and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- G. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
- H. Install insulation, specified in Section 07 2100 "Thermal Insulation," in framing-assembly members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- I. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

3.4 EXTERIOR NON-LOAD-BEARING WALL INSTALLATION

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.
- B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
- 1. Stud Spacing: As required for loading conditions, 16 inches maximum.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
- 1. Install single deep-leg deflection tracks and anchor to building structure.
 - 2. Install double deep-leg deflection tracks and anchor outer track to building structure.
 - 3. Connect vertical deflection clips to bypassing studs and anchor to building structure.
 - 4. Connect drift clips to cold-formed steel framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.
- 1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
 - 2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 - 3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.

- F. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
 - 1. Install solid blocking at 96-inch centers.
- G. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.5 OVERFRAMING / LOAD-BEARING WALL INSTALLATION

- A. Install continuous top and bottom tracks sized to match studs. Align tracks accurately and securely anchor at corners and ends, and at spacings as follows:
- B. Squarely seat studs against top and bottom tracks, with gap not exceeding 1/8 inch between the end of wall-framing member and the web of track. Fasten both flanges of studs to top and bottom tracks. Space studs as follows:
 - 1. Stud Spacing: As indicated on Drawings.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar configurations.
- D. Install horizontal bridging in stud system, spaced vertically as indicated on Drawings. Fasten at each stud intersection.
 - 1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs with a minimum of two screws into each flange of the clip angle for framing members up to 6 inches deep.
 - 2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges, and secure solid blocking to stud webs or flanges.
 - 3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- E. Install miscellaneous framing and connections, including supplementary framing, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.6 ERECTION TOLERANCES

- A. Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
 - 1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.7 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results in writing to Contractor and Architect.
- D. Cold-formed steel framing will be considered defective if it does not pass tests and inspections.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.8 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05 4000

**SECTION 05 5000
METAL FABRICATIONS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Shop fabricated steel and aluminum items.
- B. Exterior Bookdrop and face plate custom 316 alloy stainless steel
- C. Drinking fountain backsplash stainless steel 304
- D. Custom supports and attachment plates at exterior wind screen and entry elements.
- E. Bollards
- F. Misc supports and architectural fabrications at fire place
- G. Custom roof accessories such as storm colars, caps, and boots.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 05 1200 Structural Steel
- C. Section 08 8000 - Glazing
- D. Section 09 9113 - Exterior Painting: Paint finish.
- E. Section 09 9123 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS

- A. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2020.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- C. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications 2020a.
- D. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2012.
- E. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel 2017.
- F. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 1999 (Ed. 2004).
- G. SSPC-SP 2 - Hand Tool Cleaning 2018.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data sheets on each product to be used, including installation instructions.
- C. Shop Drawings: Indicate material alloy, thickness, profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- D. Designer's Qualification Statement.

1.05 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Adhere to material standards outlined in Section 05 1200 Structural steel unless noted otherwise.
- B. Entry Canopy Wind Screen Base plates, bolts and brackets: Stainless Steel 316

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- C. Materials for roof accessories shall be of same or heavier gauge of roof unless noted otherwise.
- D. Materials for roof accessories shall be of same metal as roof unless noted otherwise.
- E. Exposed exterior steel fabrications shall be galvanized and painted per Div 09.
 - 1. Exceptions: Stainless Steel.
- F. Interior exposed steel fabrications shall be primed as painted per Div 09 unless noted otherwise.
 - 1. Exceptions: Stainless steel
- G. Concealed steel items shall be primed or painted unless stainless
- H. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
- I. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- E. Provide all non-stainless steel fabrications for exposed or semi exposed exterior use with hot-dipped galvanized finish primer unless noted otherwise.
- F. Provide all stainless steel fabrications with fasteners of the same alloy.
- G. Provide protection from galvanic action between dissimilar metals.

2.03 FABRICATED ITEMS

- A. Bookdrop Chute, Faceplate and Surround.
 - 1. All Stainless 316 Alloy
 - 2. All exposed edges hemmed 1"
 - 3. Seams of chute welded water tight and ground smooth.
 - 4. Locking interior door with perimeter brush sweeps to prevent air infiltration.
 - 5. Comply with ADA and book cart manufacturer's recommendations for height of inlets and outlets for library media (books)
 - 6. Basis of design basic shape: American Book Returns HSU Thru Wall Chute
 - a. Note this product is not available in 316 alloy from the manufacturer and will need to be custom fabricated
- B. Drinking Fountain Surround
 - 1. Stainless Steel 304
 - 2. Hemmed exposed edges 1"
 - 3. Fill entire area as indicated on drawings.
 - 4. Provide shop drawings after field dimensions have been verified.
 - 5. Coordinate with Drinking fountain.
- C. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; yellow bollard cover with red reflective tape finish.
 - 1. Basis of Design Bollard Cover: postguard.com

2.04 FINISHES - STEEL

- A. Steel items - Hot Dipped galvanized unless noted otherwise, priming where noted.
 - 1. Exceptions: Do not prime surfaces where field welding is required or items to be covered with sprayed fireproofing.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

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- D. Prime Painting: Two coats.

2.05 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be embedded.

3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Obtain approval prior to site cutting or making adjustments not scheduled.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

**SECTION 05 5305
METAL GRATINGS AND FLOOR PLATES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Exterior formed metal floor grating at entries.
- B. Perimeter closure.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000: Concrete.

1.03 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.
- D. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2012.
- E. NAAMM MBG 531 - Metal Bar Grating Manual 2017.
- F. NAAMM MBG 532 - Heavy Duty Metal Bar Grating Manual 2009.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide span and deflection tables.
- C. Shop Drawings: Indicate details of component supports, openings, perimeter construction details, and tolerances.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
 - 2. Include the design engineer's seal and signature on each sheet of shop drawings.
- D. Samples: Submit one samples 4x12 inches in size illustrating surface finish, color, and texture.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 PERFORMANCE REQUIREMENTS

- A. Design Live (Pedestrian) Load: Uniform load of 150 lb/sq ft minimum; concentrated load of 400 lbs.
- B. Maximum Spacing Between Bars: ADA Compliant.

2.03 ACCESSORIES

- A. Fasteners and J-Hooks: Galvanized steel:
- B. Perimeter Closure: Of same material as grating.

2.04 FABRICATION

- A. Grating Depth: 1 1/2"
- B. Bearing bar thickness 3/16"
- C. Rectangular Cross bars 4" on center.
- D. Top Surface: Serrated

2.05 FINISHES

- A. Galvanizing for Steel Shapes: ASTM A123/A123M.
- B. Galvanizing for Steel Hardware: ASTM A153/A153M.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that opening sizes and dimensional tolerances are acceptable.
- B. Verify that supports are correctly positioned.

3.02 INSTALLATION

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

3.03 TOLERANCES

- A. Maximum Space Between Adjacent Sections: 3/16 inch.
- B. Maximum Variation From Top Surface Plane of Adjacent Sections: 1/16" inch

END OF SECTION

**SECTION 06 1000
ROUGH CARPENTRY**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Non-structural dimension lumber framing.
- B. Rough opening framing for doors, windows, and roof openings.
- C. Sheathing.
- D. Exterior treated wood columns for fuel tank screen
- E. Preservative treated wood materials.
- F. Fire retardant treated wood materials.
- G. Miscellaneous framing, blocking and backing.
- H. Concealed wood blocking, nailers, and supports.
- I. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS

- A. Section 07 2500 - Weather Barriers: Water-resistive barrier over sheathing.
- B. Section 07 6200 - Sheet Metal Flashing and Trim: Sill flashings.
- C. Section 07 4623 Siding

1.03 REFERENCE STANDARDS

- A. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing 2003 (Reapproved 2009).
- B. ASTM D2898 - Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing 2010 (Reapproved 2017).
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2016.
- D. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials 2016.
- E. AWPA U1 - Use Category System: User Specification for Treated Wood 2017.
- F. PS 1 - Structural Plywood 2009.
- G. PS 2 - Performance Standard for Wood-Based Structural-Use Panels 2010.
- H. WWPA G-5 - Western Lumber Grading Rules 2017.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide technical data on all products noted in drawings or specifications including preservatives, adhesives and finish treatments.

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.
- B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 GENERAL 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.

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- C. Moisture Content: Kiln-dry or MC15.
- D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 - 1. Lumber: S4S, No. 2 or Standard Grade.
 - 2. All exterior wood to be treated or cedar unless indicated otherwise.

2.03 SHEATHING

- A. Roof Sheathing: Exterior type, Structural I Sheathing.
 - 1. Bond Classification: Exterior.
 - 2. Span Rating: 32/16
 - 3. Nominal thickness: As indicated.
- B. Wall Sheathing: Plywood
 - 1. Bond Classification: Exterior.
 - 2. Grade: Structural I Sheathing.
 - 3. Span Rating: Not less than 32/16
 - 4. Nominal Thickness: As indicated but not less than 1/2"
 - 5. Edge Profile: Square edge.
- C. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
- D. 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.Ex
- E. Exterior Cedar Furring
 - 1. At exterior wood siding provide 1x3 cedar furring.
 - a. Provide vertical furring for Siding-1 Horizontal application.at 16" OC
 - b. Provide horizontal furring for Siding-2 appliation at 16" OC

2.04 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. Metal and Finish: Stainless steel unless indicated otherwise.
- B. Post Bases for Columns
 - 1. Location: Fuel Tank Screen
 - 2. Material: Stainless Steel 316 alloy
- C. Sill Gasket on Top of Foundation Wall: 1/4 inch thick, 6 inch wide, neoprene or epdm.
- D. Sill Flashing: As specified in Section 07 6200.

2.05 FACTORY WOOD TREATMENT

- A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
 - 1. General: Where fire-retardant-treated materials are indicated, use materials complying with requirement in this article that are acceptable to the authorities having jurisdiction and with fire test response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
 - 2. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
 - 3. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.
- B. Fire Retardant Treatment:

1. Fire retardant treated plywood by Pressuer Process. Products with a flame spread index of 25 or less when tested accordin to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an addition al 20 minutes, and with the fame front not extending more than 10.5 feet beyond the cnterline of the burners ot any time during the test.
 - a. Use treatment that does not promote corrosion of metal fasterns.
 - b. Exterior type treated materials shall be tested after being subjected to accelerated weathering accordin to ASTM D 2898.
- C. Preservative Treatment:
 1. Preservative Pressure Treatment of Lumber Above Grade: AWWPA U1, Use Category UC2 for interior construction note in contact with ground, Use Category UC3B for exterior construction not in contact with ground, and use category UC4A for items in contact with the ground.
 - a. Preservative Chemicals: Acceptable to Authorities having Jurisdiction and containing no arsenic or chromium. Don ot use inorganic boron (SBX) ffor Sill plates.
 - b. For exposed items indicated to recieve a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
 - c. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
 - d. Treat lumber exposed to weather or exposed to exterior air environment.
 - e. Treat lumber in contact with masonry or concrete.
 - f. Treat lumber less than 18 inches above grade.
 - g. Treat lumber at all blocking and nailing at roof eaves.

PART 3 EXECUTION

3.01 PREPARATION

- A. Where wood framing bears on cementitious foundations, install full width sill flashing continuous over top of foundation, lap ends of flashing minimum of 4 inches and seal.
- B. Install sill gasket under sill plate of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.
- C. 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 BLOCKING, NAILERS, AND SUPPORTS

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

3.04 ROOF-RELATED CARPENTRY

- A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

3.05 INSTALLATION OF CONSTRUCTION PANELS

- A. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing using fasteners and spacings appropriate to wind and other structural loads.
- B. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing, using fasteners appropriate to wind and other structural loads..
- C. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.

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1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
3. Install adjacent boards without gaps.

3.06 CLEANING

- A. Waste Disposal: Comply with the requirements of Section 01 7419 - Construction Waste Management and Disposal.
 1. Comply with applicable regulations.
 2. Do not burn scrap on project site.
 3. Do not burn scraps that have been pressure treated.
- B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
- C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06 2000
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Finish carpentry items - Interior.
 - 1. Built in custom benches at window areas including integrated custom finned tube enclosures and access panels at children's and teen areas.
 - 2. Fire place surround and shelving.
 - 3. Built in Bookshelving units in Entry Vestibule and Lobby.
 - 4. Custom wood and composite endpanels and tops for bookstacks
 - 5. Perimeter bookshelving wood panel tops and sides
 - 6. Framing and trim for selected artworks recessed into wall.
 - 7. Hardware and attachment accessories.
 - 8. Coat Hooks in Lobby
 - 9. See finish plans and interior elevations for additional items.
- B. Finish Carpentry Items - Exterior
 - 1. Wood trim and accessories at exterior soffits, windows, corners, and base of wall.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.
- B. Section 06 4100 - Architectural Wood Casework: Shop fabricated custom cabinet work.
- C. Section 08 8000 - Glazing: Glass and glazing of artworks and relite windows .
- D. Section 09 9123 - Interior Painting: Painting of finish carpentry items.
- E. Section 09 9300 - Staining and Transparent Finishing: Transparent finishing of finish carpentry items.

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, U.S. Version 4.0 2021.
- C. AWPA U1 - Use Category System: User Specification for Treated Wood 2017.
- D. BHMA A156.9 - American National Standard for Cabinet Hardware 2015.
- E. NHLA G-101 - Rules for the Measurement & Inspection of Hardwood & Cypress 2015.
- F. PS 1 - Structural Plywood 2009.

1.04 ADMINISTRATIVE REQUIREMENTS

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

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data:
 - 1. Provide manufacturer's product data, storage and handling instructions for all products identified in drawings or specifications.
- C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
 - 1. Provide the information required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
- D. Samples: Submit two samples of finish plywood, 6x6 inch in size illustrating wood grain, edge condition and specified finish.
- E. Samples: Submit two samples of wood trim 6 inch long.

1.06 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented 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.

1.07 MOCK-UP

- A. Provide mock up sample of the followign 6x6 inches typical
 - 1. Corner of shelving top to shelving side panel
 - 2. Bench vertical to horizontal
 - 3. Circle bench horizontal to vertical with trim
 - 4. Fastener installed at removable panel
- B. Provide mock-up of repeatable fabrications for approval prior to multiple fabrications ensuing.

1.08 DELIVERY, STORAGE, AND HANDLING

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

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

- A. Quality Standard: Premium Grade, unless noted otherwise.

2.02 MATERIALS:

- A. WD-4: Hardwood Veneer Core Plywood: In accordance with AWI Standards, Section 200.
 - 1. Identified as 'Finish Plywood' or 'Veneer Finish Plywood' or "Euro core Plywood' in drawings
 - 2. Grade AA maple veneer plywood
 - 3. Thickness: 3/4" typical. and 1/2" thicknesses where indicated.
 - a. Note several locations include multiple layers of 3/4" material.
 - 4. 9 ply for 1/2" thickness; 13 ply for 3/4" thickness.
 - 5. Ease edges to 16" radius and fill voids in all edges that may become exposed.
- B. Aluminum Grille at inlets and outlets of finned tube custom enclosures
 - 1. Basis of Design Manufacturer: Architectural Grille, Brooklyn, NY, (800)387-6267
 - a. Product: AG-20, A Frame Profile
 - b. Type: Bar Grille
 - c. Material: Extruded Aluminum
 - d. Depth: 3/4"
 - e. Length: As indicated on drawings.
 - f. Fastening Method:
 - 1) Horizontal Installation: #503 gravity
 - 2) Vertical Installation: #508 with screw tabs
 - g. Corner: Mitered.
 - h. Finish: Clear anodized, clean surfaces of rust, scale, grease, adn foreign matter prior to finishing.
- C. Endpanels and tops for bookstacks
 - 1. Locations: All endpanels at library shelving stacks and perimeter shelving.
 - 2. Typical Endpanel: 3/4" WD-4 Panel
 - a. Finish: Clear finish.
 - b. Edge Trim: 1 1/4" annodizedaluminum angle- all exposed edges

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- c. Backing: 1/4" Maple veneer Plywood as required for flush end panel installation.
 - d. Attachment: Stainless Steel Screws from back side of panel through gussets in Cantileaver system and other end panel support points. Heads painted to match steel shelving.
- D. Book Shelving Unit Tops to be provided at all free standing units less than 66" in height and all perimeter units.
- 1. Provide 3/4" Finish Plywood top. (WD-4)

2.03 EXTERIOR WOOD TRIM COMPONENTS

- A. Provide western redwood cedar trim (no heartwood) in all exposed locations unless noted otherwise.

2.04 EXTERIOR TRIM ACCESSORIES

- A. Provide accessories to accomodate proper pest and weather protection and promote airflow at soffit vents.
- 1. Fiberous Vent Closure
 - a. Basis of Design: Flex-o-vent :
<https://marcoindustries.com/products/ventilation/flex-o-vent>
- B. Pest Protection
- 1. Bird Screen
 - 2. Bug Screen

2.05 FASTENINGS

- A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.
- B. Fasteners for Exterior Applications: Stainless steel; length required to penetrate wood substrate 1-1/2 inch minimum or through 90% of substrate materials thinner than 1 1/2"

2.06 HARDWARE

- A. Hardware: Comply with BHMA A156.9.
- B. Standard Shelf, Countertop, and Workstation Brackets:
- 1. Material: Steel
 - 2. Finish: Factory-applied, textured powder coat.
- C. Coat Hooks
- 1. Basis of Design Manufacturer: Sugatune
 - 2. Products:
 - a. Hooks: (8) XL-HJT Single Hook
 - b. Mounting Bar: WD-4 3/4" panel 9" high and 84" long- ease all edges.

2.07 WOOD TREATMENT

- A. Factory-Treated Lumber: Comply with requirements of AWPA U1 - Use Category System for pressure impregnated wood treatments determined by use categories, expected service conditions, and specific applications.
- B. See 06 1000 Rough Carpentry for additional information on wood treatment.

2.08 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.

2.09 SHOP FINISHING

- A. Sand work smooth and set exposed nails and screws.
- B. Apply wood filler in exposed nail and screw indentations.
- C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.

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- D. 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. Sheen: Flat.
- E. Prime paint surfaces in contact with cementitious materials.
- F. Back prime woodwork items to be field finished, prior to installation.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.

3.02 INSTALLATION

- A. Install custom fabrications in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated and in accordance with additional tolerances noted within this section.
- B. Install factory-fabricated units in accordance with manufacturer's printed installation instructions.
- C. Set and secure materials and components in place, plumb and level.
- D. 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 TOLERANCES

- A. Maximum Variation from True Position: 1/16 inch.
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION

SECTION 06 4100
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Specially fabricated cabinet units.
- B. Casework at gathering area.
- C. Solid surface countertops including toilet room sink counters with integrated bowls.
- D. Integral sink bowls to be included with solid surface fabrication
- E. Solid surface material for window sills and other counters
- F. Hardware including
- G. Countertop Support Brackets

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.
- B. Section 10 2800 Toilet and Bath Accessories
- C. Section 22 400 Plumbing Fixtures

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, U.S. Version 4.0 2021.
- C. BHMA A156.9 - American National Standard for Cabinet Hardware 2015.
- D. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood 2016.
- E. NEMA LD 3 - High-Pressure Decorative Laminates 2005.
- F. UL (DIR) - Online Certifications Directory Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected fabricators and installers.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories. Also include all elevations, corner details, interface with adjacent construction, and at least one 3D or axonometric overview.
- C. Product Data: Provide data for all components, materials, products and hardware including but not limited to substrate materials, fasteners, laminates, edgebanding, hinges, pulls, glides and any exposed surface product.
- D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.
- E. Samples: Submit samples of all exposed and semi exposed materials to be included in the work.
- F. Submit mock up sample of countertop edge profile and substrate.

1.06 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
 - 1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect units from moisture and physical damage during transportation and storage.
 - 1. Once products are in Unalaska, store indoors in climate controlled space.

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1.08 FIELD CONDITIONS

- A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 CABINETS

- A. Quality Standard: Premium Grade, in accordance with AWI/AWMAC/WI (AWS), AWMAC/WI (NAAWS), or AWI, unless noted otherwise.
 - 1. Wood Drawer Construction: Dovetailed Joints
 - 2. Drawer Guides: Extra Heavy duty, 150 lb min soft close.
 - 3. Box construction: All plywood or solid hardwood.
 - 4. MDF or HDF: Use is allowed only where explicitly indicated and must be moisture resistant.

2.02 WOOD-BASED COMPONENTS

- A. Wood fabricated from old growth timber is not permitted.

2.03 LAMINATE MATERIALS

- A. Manufacturers:
 - 1. Formica Corporation; Sharon Soule, 907-272-3030, info@alaskaflorwall.com: www.formica.com/#sle.
 - 2. Willis; Ted Lambert, 206-200-6576, tedl@4willis.com: www.4willis.com.
- B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.

2.04 INTEGRAL SINKS FOR SOLID SURFACE TOPS

- A. Integral sink basin referenced as P-3H of the plumbing fixture schedule and SSM-2 on the Finish Schedule.
- B. Basis of Design Manufacturer: LG HAUSYS
- C. Product: See finish legend.

2.05 COUNTERTOPS

- A. Solid Surface Countertops and Trim
 - 1. Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with ISSFA-2
 - 2. Basis of Design : LG Hausys
 - 3. All solid surfaces shall be fully supported by minimum 1/2" continuous plywood.
 - 4. All seams welded.
- B. Plastic Laminate Countertops: Substrate covered with HPDL, post formed with bullnose edge and coved backsplash unless indicated otherwise..
- C. Substrates
 - 1. Cores for counter tops in wet areas having sinks or lavatories are 3/4" thick exterior grade plywood with waterproof adhesive, Fir or Poplar plywood, veneer core only.
 - 2. Moisture resistant medium density fiberboard

2.06 ACCESSORIES

- A. Adhesive: per manufacturers recommendations for best results..
- B. Plastic Edge Banding: Extruded PVC 3mm finish; self locking serrated tongue; of width to match component thickness.
 - 1. Color: To match laminate pattern and color unless indicated otherwise.
 - 2. Use at All laminate doors or other exposed or semi exposed edges.
 - 3. Basis of Design Products, unless noted otherwise:
 - a. Doellken .018 x 15/16 mm PVC
 - b. Doellken 3D
 - c. Doelken Fusion Edge

2.07 HARDWARE

- A. Hardware: BHMA A156.9, types as approved by architect for quality grade specified.
- B. Fixed Standard, Specialty and Countertop Brackets:
 - 1. Material: Steel.
 - 2. Finish: Factory-applied powder coat.
 - 3. Color: Selected by Architect from manufacturer's full range.
 - 4. Manufacturers:
 - a. Rakks/Rangine Corporation; www.rakks.com/#sle
- C. Drawer and Door Pulls:
 - 1. Basis of Design Product: Mockett DP128 6 1/2" nominal Flat Top pull
 - 2. Finish: Satin Stainless Steel
- D. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with chrome finish.
- E. Drawer Slides:
 - 1. Type: Full extension.
 - 2. Static Load Capacity: Extra Heavy Duty grade. 150 lb capacity minimum.
 - 3. Mounting: Side mounted.
 - 4. Stops: Integral type.
 - 5. Features: Provide self closing/stay closed type.
- F. Hinges: European style concealed self-closing type, steel with polished finish.
 - 1. Manufacturers:
 - a. Grass America Inc; TEC Soft-Close: www.grassusa.com/#sle.
- G. Soft Close Adapter: Concealed, frame-mounted, screw-adjustable damper ; steel with polished finish.

2.08 FABRICATION

- A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
- C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
- D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Locate counter butt joints minimum 2 feet from sink cut-outs.
 - 1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
 - 2. Cap exposed plastic laminate finish edges with 3mm material of same finish and pattern unless noted otherwise.
- E. Provide cutouts for fixtures and fittings. Verify locations of cutouts from on-site dimensions. Seal cut edges and provide banding or estucheans.

2.09 SHOP FINISHING

- A. Sand work smooth and set exposed nails and screws.
- B. For opaque finishes, apply wood filler in exposed nail and screw indentations and sand smooth.
- C. On items to receive transparent finishes, use wood filler matching or blending with surrounding surfaces and of types recommended for applied finishes.
- D. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified. Architect to approve products within those guidelines.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

- A. Install work in accordance with AWI/AWMAc/WI (AWS) or AWMAc/WI (NAAWS) requirements for grade indicated.
- B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
- C. Use concealed joint fasteners to align and secure adjoining cabinet units.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
- E. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.03 ADJUSTING

- A. Adjust installed work.
- B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

- A. Clean casework, counters, shelves, hardware, fittings, and fixtures.
- B. Protect completed work from damage from subsequent construction operations.

END OF SECTION

SECTION 07 0150.19
PREPARATION FOR RE-ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preparation partial removal of existing roofing system in preparation for replacement roofing system in designated areas as indicated on drawings.
- B. Removal of existing flashing and counterflashings.
- C. Temporary roofing protection.

1.02 RELATED REQUIREMENTS

- A. Section 07 41 13 - Metal Roof Panels
- B. Section 07 6200 - Sheet Metal Flashing and Trim: Replacement of flashing and counterflashings.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with affected mechanical and electrical work associated with roof penetrations.
- B. Preinstallation Meeting: Convene one week before starting work of this section.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop drawings: Provide layout drawings and details of transitions between existing and new construction.
- C. Materials Removal Company Qualification Statement.
- D. Installer's Qualification Statement.

1.05 QUALITY ASSURANCE

- A. Materials Removal Company Qualifications: Company specializing in performing work of type specified with at least three years of documented experience.
 - 1. Comply with removal and disposal regulations of local authorities having jurisdiction (AHJ).
- B. Preconstruction Meeting: To be held at least 10 days before work on demolition commences and to include demolition, roofing, and general contractor participants as well as architect and owner's representative.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.

1.07 FIELD CONDITIONS

- A. Do not remove existing roofing membrane when weather conditions threaten the integrity of building contents or intended continued occupancy.
- B. Maintain continuous temporary protection prior to and during installation of new roofing system.
- C. Verify that occupants have been evacuated from building areas when work on structurally impaired roof decking is scheduled to begin.

1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 COMPONENTS

- A. Refer to following sections for additional information on components relating to this work:
 - 1. Partial removal of existing roofing system in preparation for new roofing system in designated areas as indicated on drawings, refer to Section 07 6100.
 - 2. Remove existing flashing and counterflashings in preparation for replacement of these materials as part of this work, refer to Section 07 6200 for material requirements.

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2.02 MATERIALS

- A. Patching Materials: Provide necessary materials in accordance with requirements of existing roofing system.
- B. Temporary Roofing Protection Materials:
 - 1. Contractor's responsibility to select appropriate materials for temporary protection of roofing areas as determined necessary for this work.

PART 3 EXECUTION

3.01 MATERIAL REMOVAL

- A. Repair existing wood deck surface to provide smooth working surface for new roof system.

3.02 PROTECTION

- A. Provide protection of existing roofing system that is not having work performed on it.
- B. Provide temporary protective sheeting over uncovered deck surfaces and exposed areas of the building.
 - 1. It is the contractor's responsibility to protect the interior of the existing building to remain and the contents therein at all times.
- C. Provide for surface drainage from sheeting to existing drainage facilities.

END OF SECTION

SECTION 07 0553
FIRE AND SMOKE ASSEMBLY IDENTIFICATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Identification markings for fire and smoke rated partitions, and fire rated walls.

1.02 REFERENCE STANDARDS

- A. ICC (IBC) - International Building Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

PART 2 PRODUCTS

2.01 FIRE AND SMOKE ASSEMBLY IDENTIFICATION

- A. Regulatory Requirements: Comply with "Marking and Identification" requirements of "Fire-Resistance Ratings and Fire Tests" chapter of ICC (IBC).

END OF SECTION

**SECTION 07 1113
WATERPROOFING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Bituminous dampproofing. (also noted as sheet waterproofing or water proofing membrane.)
- B. Drainage panels.

1.02 REFERENCE STANDARDS

- A. ASTM D41/D41M - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing 2011 (Reapproved 2016).
- B. NRCA (WM) - The NRCA Waterproofing Manual 2005.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide properties of primer, bitumen, and mastics.
- C. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.04 QUALITY ASSURANCE

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

1.05 FIELD CONDITIONS

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

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Bituthene 3000; Grace.

2.02 ACCESSORIES

- A. Drainage Panel: 3/8 inch thick formed plastic, hollowed sandwich.
 - 1. Product: Hydroduct 220 manufactured by W.R. Grace.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions are acceptable prior to starting this work.
- B. Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.
- C. Verify that items penetrating surfaces to receive dampproofing are securely installed.

3.02 PREPARATION

- A. Protect adjacent surfaces not designated to receive dampproofing.
- B. Clean and prepare surfaces to receive dampproofing in accordance with manufacturer's instructions.
- C. Do not apply dampproofing to surfaces unacceptable to manufacturer.
- D. Apply mastic to seal penetrations, small cracks, or minor honeycombs in substrate.

3.03 APPLICATION

- A. Perform this work in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.
- B. Prime surfaces in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.
- C. Prime surfaces at a rate approved by manufacturer for application indicated, and allow primer to dry thoroughly.
- D. Seal items watertight with mastic, that project through dampproofing surface.

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- E. Place drainage panel directly over dampproofing, butt joints, place to encourage drainage downward.
- F. Scribe and cut boards around projections, penetrations, and interruptions.

END OF SECTION

**SECTION 07 2100
THERMAL INSULATION**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Board insulation at perimeter foundation wall, underside of floor slabs, over roof deck, and over roof sheathing.
- B. Semi Rigid Insulation Board Insulation and Fiberglass Girts at exterior wall and soffits.
- C. Batt insulation for filling perimeter window and door shim spaces, crevices in exterior wall and roof, and other areas as indicated.
- D. Thermal Barrier cover board over metal roof deck.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete:
- B. Section 06 1000 - Rough Carpentry:
- C. Section 07 2119 - Foamed-In-Place Insulation: Plastic foam insulation other than boards.
- D. Section 07 2500 - Weather Barriers:
- E. Section 07 8400 - Firestopping: Insulation as part of fire-rated through-penetration assemblies.
- F. Section 07 9200 - Joint Sealants
- G. Section 09 2116 - Gypsum Board Assemblies: Acoustic insulation inside walls and partitions.

1.03 REFERENCE STANDARDS

- A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus 2017.
- B. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications 2013 (Reapproved 2019).
- C. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation 2018.
- D. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation 2014 (Reapproved 2019).
- E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- F. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C 2019a.
- G. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials; National Fire Protection Association; 2006.
- H. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
- C. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

1.05 FIELD CONDITIONS

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

1.06 COORDINATION

- A. Coordinate the work with Section 07 2500 for installation of vapor retarder and weather barriers.

PART 2 PRODUCTS

2.01 APPLICATIONS

- A. Insulation Under Concrete Slabs a Pavement: Expanded Polystyrene (EPS) 60 psi, Type VII.
- B. Insulation at Perimeter of Foundation: Expanded Polystyrene (EPS) 25 psi, Type IV.
- C. Insulation Over Metal Stud Framed Walls, Continuous: Semirigid Rockwool Insulation board with fiberglass girts.
- D. Insulation Over Roof Deck: Expanded Polystyrene (EPS) 40 psi, Type VI.

2.02 FOAM BOARD INSULATION MATERIALS

- A. Expanded Polystyrene (EPS) Board Insulation: Complies with ASTM C578.
 - 1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
 - 2. Flame Spread Index: 75 or less, when tested in accordance with ASTM E84.
 - 3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
 - 4. Water Absorption: 0.3% maximum volume in accordance with ASTM C272.
 - 5. Compressive Strength: As identified above for each application.
 - 6. Effective R-Values at 25 F: Type IV 4.8; Type VI 5.0; Type VII 5.1 per ASTM C518 or C177.

2.03 SEMI RIGID FIBERBOARD INSULATION MATERIALS

- A. Mineral Fiberboard Insulation: Rigid or semi-rigid mineral fiber, ASTM C612 or ASTM C553; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
 - 1. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
 - 2. Board Size: 24 by 48 inches.
 - 3. Thermal Resistance: R-value of 4.2 degrees F hr sq ft/Btu per inch at 75 degrees F, minimum, when tested according to ASTM C518.
 - 4. Manufacturers:
 - a. Thermafiber, Inc; RainBarrier: www.thermafiber.com/#sle.
 - b. ROCKWOOL (ROXUL, Inc); CAVITYROCK: www.rockwool.com/#sle.

2.04 BATT INSULATION MATERIALS

- A. Batt Insulation: ASTM C 665; preformed batt; friction fit, conforming to the following:
 - 1. Material: Glass or mineral fiber.
 - 2. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
 - 3. Formaldehyde Content: Zero.

2.05 THERMAL BARRIER AT METAL ROOF DECK

- A. 1/2" Dens Deck Prime
 - 1. Moisture resistant gypsum core.
 - 2. Glass matt faces both sides.

2.06 ACCESSORIES

- A. Fiberglass Girts:
 - 1. Basis of Design: GreenGirt, SMARTci, by Advanced Architectural Products: www.smartcisystems.com.
 - 2. Where required: As part of semi-rigid insulation assembly at all new exterior walls and soffits, and additional locations as indicated.
 - 3. Size and Spacing: Fiberglass Z installed at 24 inches on center or as indicated by structural. Size (depth) to match depth indicated for insulation at each location.
- B. Insulation pins as needed to maintain position semi-rigid insulation on walls and soffits.

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 honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER

- A. Install boards on foundation perimeter.
- B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 BOARD INSTALLATION AT EXTERIOR WALLS

- A. Install mineral fiber boards vertically on walls with fiberglass Z girts.
 - 1. Install girts and semirigid mineral fiber boards per manufacturer's instructions.
- B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.04 BOARD INSTALLATION UNDER CONCRETE SLABS

- A. Place insulation under slabs on grade after base for slab has been compacted. See drawings for unique conditions.
- 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.

3.05 BOARD INSTALLATION OVERSLOPE ROOF SHEATHING OR ROOF STRUCTURE

- A. Installation of board insulation over sloped roof structure or roof sheathing is specified in Section 06 1000.

3.06 BATT INSTALLATION

- A. Install insulation and vapor retarder in accordance with manufacturer's instructions.
- B. Install in exterior wall, roof, and ceiling spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate all miscellaneous gaps and voids unless noted otherwise.
- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
- E. At metal framing, place vapor retarder on warm side of insulation; lap and seal sheet retarder joints over member face.
- F. Tape seal tears or cuts in vapor retarder.
- G. 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.

3.07 PROTECTION

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

END OF SECTION

**SECTION 07 2119
FOAMED-IN-PLACE INSULATION**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Foamed-in-place insulation.
 - 1. In exterior wall crevices.
 - 2. At junctions of dissimilar wall and roof materials.
- B. Pourable insulation at interface between roof and penetrating boiler flue.
- C. Protective thermal barrier coating on panels.

1.02 REFERENCE STANDARDS

- A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus 2017.
- B. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen 2004 (Reapproved 2012).

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide product description, insulation properties, overcoat properties, and preparation requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Foamed-In-Place Insulation:
 - 1. Tigerfoam ASTM E84 Class 1 High Rise
- B. Pourable Foam Insulation At boiler flue
 - 1. WR Meadows Pourthane Non Sag Joint Sealant

2.02 ACCESSORIES

- A. Primer: As required by insulation manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify work within construction spaces or crevices is complete prior to insulation application.
- B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation or overcoat adhesion.

3.02 PREPARATION

- A. Mask and protect adjacent surfaces from over spray or dusting.
- B. Apply primer in accordance with manufacturer's instructions.

3.03 APPLICATION

- A. Apply insulation in accordance with manufacturer's instructions.

END OF SECTION

**SECTION 07 2500
WEATHER BARRIERS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Vapor Retarders: Materials to make exterior walls, joints between exterior walls and roof, joints around frames of openings in exterior walls, and underslabs and ceilings water vapor resistant and air tight.
- B. Air Barriers: (Also noted as Weather Barrier) Materials that form a system to stop passage of air through exterior walls, joints between exterior walls and roof, joints around frames of openings in exterior walls, and allow the passage of water vapor to escape from within the building.
- C. Roof Underlayment: Secondary water resistant membrane materials installed under finished roof systems.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete:
- B. Section 03 0513 Underslab Vapor Barrier
- C. Section 06 1000 - Rough Carpentry: Exterior Sheathing
- D. Section 07 2100 Thermal Insulation
- E. Section 07 4113: Metal Roofing
- F. Section 07 6200 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with weather barriers.
- G. Section 09 2116 - Gypsum Board Assemblies:

1.03 DEFINITIONS

- A. Weather Barrier: Assemblies that form either water-resistive barriers, air barriers, or vapor retarders.
- B. Air Barrier: Air tight barrier made of material that is relatively air impermeable but water vapor permeable, both to the degree specified, with sealed seams and with sealed joints to adjacent surfaces. Note: For the purposes of this specification, vapor impermeable air barriers are classified as vapor retarders.
- C. Vapor Retarder: Air tight barrier made of material that is relatively water vapor impermeable, to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.
 - 1. Water Vapor Permeance: For purposes of conversion, $57.2 \text{ ng}/(\text{Pa s sq m}) = 1 \text{ perm.}$
- D. Roof Underlayment: Materials over roof sheathing or deck and under metal roofing system with water resistive properties as specified.

1.04 REFERENCE STANDARDS

- A. AATCC Test Method 127 - Water Resistance: Hydrostatic Pressure Test 2018.
- B. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection 2020.
- C. ASTM D4397 - Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications 2016.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- E. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials 2016.
- F. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs 2017.
- G. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials 2021a.

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- H. ICC-ES AC38 - Acceptance Criteria for Water-Resistive Barriers 2016, with Editorial Revision (2019).
- I. ICC-ES AC148 - Acceptance Criteria for Flexible Flashing Materials 2017.
- J. ICC-ES AC212 - Acceptance Criteria for Water-Resistive Coatings Used as Water-Resistive Barriers over Exterior Sheathing 2015.

1.05 SUBMITTALS

- A. See Division 1 for Submittal procedures
- B. Product Data: Provide data on material characteristics and any deviations from basis of design products.
- C. Shop Drawings: Provide drawings of all detail conditions, including corners, overlaps, terminations, joints, and interfaces with adjacent materials. Include typical and project unique conditions.
- D. Manufacturer's Installation Instructions: Indicate preparation and installation methods.

1.06 FIELD CONDITIONS

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

PART 2 PRODUCTS

2.01 GENERAL DESCRIPTION

- A. See Division 1 for Substitution procedures.
- B. Weather Barrier or Air Barriers:
 - 1. Weather Barrier - 1: Self Adhered barrier on outside surface of exterior wall and soffit and/or exterior wall and soffit insulation also referred to as air barrier.
 - 2. Weather Barrier -2: Weather barrier with increased vapor permeability and adhered seams at locations as indicated.
- C. Interior Vapor Retarders:
 - 1. Vapor Retarder-1: Self Adhered membrane.
 - a. On the outside face of exterior sheathing behind the inside face of exterior insulation for walls and as indicated in wall assemblies.
 - b. Over the thermal barrier and below the insulation at the roof.
 - c. At connections between wall and roof to form a continuous vapor retarder on the warm side of insulation from the interior.
 - 2. Vapor Retarder-2: At miscellaneous locations as indicated primarily to tie into existing vapor retarders or at roof/wall connections.
- D. Roof Underlayment:
 - 1. Roof Underlayment 1: Self-adhered membrane located under metal roofing.
 - 2. Roof Underlayment 2: Self-adhered membrane located at bottom of roof vent space and where indicated.

2.02 WEATHER (AIR) BARRIER MATERIALS - WATER VAPOR PERMEABLE AND WATER-RESISTIVE

- A. See Division 1 for Substitution Procedures
- B. Air Barrier Sheet, Self Adhered: Weather Barrier - 1
 - 1. Breaking strength and Elongation to ASTM D5034: 88 lbf (391 N), machine direction; 83 lbf (369 N), cross-machine direction.
 - 2. Water Vapor Permeance tested to ASTM E96 Method B: minimum of 50.45 perms (2886 ng/Pa.s.m²)
 - 3. Water Vapor Permeance tested to ASTM E398: minimum of 52.57 perms (3007 ng/Pa.s.m²)
 - 4. Air Leakage: ≤0.00002 cfm/ft² @ 1.57 psf (≤0.0001 L/s m² @ 75 Pa) when tested in accordance with ASTM E2178 and <0.01 cfm/ft² @ 1.57 psf (<0.01 L/s m² @ 75 Pa) when tested in accordance with ASTM E2357 and. Meets Air Barrier Association of America (ABAA) requirements for "Adhesive Backed Commercial Building Wraps".

5. Water Resistance tested to AATCC 127, 550 mm hydrostatic head for 5 hours: No leakage
 6. Application Temperature: Ambient temperature must be above 20 °F (minus 6.7 °C)
 7. Surface Burning Characteristics tested to ASTM E84: Class A, Flame-spread index of less than 5, Smoke-developed index of less than 15
 8. Physical Dimensions: 0.022 inches (0.56 mm) thick and 59 inches (1.5 m) wide and 7.58 oz/yd² (257 g/m²).
 9. Ultraviolet and Weathering Resistance: Approved in writing by manufacturer for up to 180 days of weather exposure.
 10. Surface Burning Characteristics: Flame spread index of 5 or less, and smoke developed index of 15 or less, when tested in accordance with ASTM E84.
 11. Basis of Design Manufacturer:
 - a. VaproShield, LLC; WrapShield SA: www.vaproshield.com.
 - b. Alternate: Air Shield by WR Meadows.
- C. Air Barrier Sheet mechanically fastened with Integrated Tape: Weather Barrier -2
1. Breaking strength and Elongation to ASTM D5034: 100.1 lbf (445.3 N), machine direction; 86.1 lbf (383 N), cross-machine direction.
 2. Water Vapor Permeance tested to ASTM E96 Method B: minimum of 66.9 perms (3827 ng/Pa.s.m²)
 3. Water Vapor Permeance tested to ASTM E398: minimum of 72.04 perms (4121 ng/Pa.s.m²)
 4. Air Leakage: ≤0.0001 cfm/ft² @ 1.57 psf (≤0.0004 L/s m² @ 75 Pa) when tested in accordance with ASTM E2178 and ≤0.01 cfm/ft² @ 1.57 psf (≤0.01 L/s m² @ 75 Pa) when tested in accordance with ASTM E2357.
 5. Water Resistance tested to AATCC 127, 550 mm hydrostatic head for 5 hours: No leakage
 6. Application Temperature: No minimum temperature.
 7. Surface Burning Characteristics tested to ASTM E84: Class A, Flame-spread index of 0, Smoke-developed index of less than 55
 8. Physical Dimensions: 0.022 inches (0.56 mm) thick and 59 inches (1.5 m) wide and 5.7119 oz/yd² (193.67 g/m²).
 9. Basis of Design Manufacturers
 - a. Vaproshield Wrapshield IT

2.03 MEMBRANE FLASHINGS

- A. TRANSITION AND FLASHING MEMBRANE Two part Flashing System
1. Self-adhered air barrier transition and flashing membrane for all window jambs, headers, fully self-adhered water-resistive vapor permeable sheet membrane
 2. VaproLiqui-Flash™ by VaproShield, a liquid-applied vapor permeable air barrier flashing material with vapor permeance and resistance to air leakage properties compatible with the primary air barrier membrane.
 3. TRANSITION FLASHING
- B. Flexible 80 mil (2 mm) extruded silicone sheet.
1. VaproSilicone Transition™: 4, 6 or 9 inches (10.2, 15, 23 cm) x 50 feet (15.24 m) long.
 2. Dynamic Movement Capability: +200 / -50 % when tested in accordance to ASTM C1523.
 3. Elongation: 400 % when tested in accordance to ASTM D412.
 4. Tensile Strength: 295 psi (2.03 MPa) when tested in accordance with ASTM D412.
 5. Tear Strength: 20 ppi (3.5 N/mm) when tested in accordance to ASTM D624.

2.04 VAPOR RETARDER MATERIALS (AIR BARRIER AND WATER-RESISTIVE)

- A. See Division 1 for Substitution procedures
- B. Vapor Retarder -1:
1. Type: Rubberized asphalt bonded to thermoplastic sheet, self-adhesive.
 2. Thickness: 40 mil (0.040 inch), nominal.
 3. Puncture Resistance: 40 lbf (178 N) per ASTM E154.

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4. Tensile Strength: 500 psi per ASTM D412, modified.
 5. Water Vapor Permeance: 0.03 Perms maximum, when tested in accordance with ASTM E96/E96M Method A.
 6. Seam and Perimeter Tape: As recommended by sheet manufacturer.
 7. Penetrations: Use waterproofing membrane and flashing details per manufacturer's recommendations.
 8. Manufacturers:
 - a. Henry Company; Blueskin SA LT: www.henry.com/#sle.
- C. Vapor Retarder -2: ASTM D4397 polyethylene film, clear.
1. Thickness: 10 mil.
 2. Water Vapor Permeance: As required by referenced standard for thickness specified.
 3. Seam and Perimeter Tape: Polyethylene self adhering type, mesh reinforced, 2 inches wide, compatible with sheet material.
- D. Vapor Retarder -3: ASTM D4397 polyethylene film reinforced with glass fiber square mesh, clear.
1. Thickness: 15 mil.
 2. Water Vapor Permeance: As required by referenced standard for thickness specified.
 3. Seam and Perimeter Tape: Polyethylene self adhering type, mesh reinforced, 2 inches wide, compatible with sheet material.
- E. Roof Underlayments
1. Roof Underlayment-1 Water Resistant with protection against ice damming.
 - a. Self adhered rubberized waterproof roofing membrane underlayment designed to protect from damages caused by water infiltration as a result of ice dams or wind driven rain. ASTM D1970 and ASTM E108/UL 790 Class A fire rated.
 - 1) Basis of Design Product: Henry Blueskin PE200HT
 - 2) Thickness: 40 mils
 - 3) Air Leakage at 75Pa <.004 per ASTM E2357
 - 4) Nail Sealability Per ASTM D1970
 - 5) Moisture Vapor Permeance: 0.05 per ASTM E96
 - 6) Service Temperature: -40-260 degrees F
 2. Roof Underlayment-2 Water resistive and vapor permeable.
 - a. Fully self-adhered water-resistive vapor permeable roof underlayment membrane, components and accessories must be obtained as a single-source to ensure total system compatibility and integrity.
 - b. Basis of Design: Slopesheild SA Plus by Vaproshield.
 - c. Fully self-adhered water-resistive vapor permeable roof underlayment (Basis of Design)
 - 1) Primary fully self-adhered roof underlayment membrane shall be a fully adhered vapor permeable water-resistive sheet membrane consisting of multiple layers of UV stabilized spun-bonded polyethylene having the following properties:
 - (a) Color: Black with White Lettering with allowable UV exposure for 180 days (6 Months).
 - (b) Adhesive: 100% coverage on back side of membrane (not spot applied), vapor permeable, with zero VOC's.
 - d. Air Leakage: 0.00086 cfm/ft² @ 1.57 psf (0.00437 L/s•m² @ 75 Pa) when tested in accordance with ASTM E2178.
 - e. Water Vapor Permeance tested to ASTM E398 and ASTM E96 water method @23°C 50%RH: minimum of 30 perms grain/h•ft²•inchHg (1716 ng/Pa • s • m²)
 - f. Water Resistance tested (Ponding): AC48, 24 inches (610 mm) 48 hours, Pass, no leakage
 - g. Tensile Strength tested to ASTM D5034: Pass, 135 lbf/in. (23.6 N/mm), machine direction; 113 lbf/in. (19.8 N/mm), cross-machine direction
 - h. Application Temperature: Ambient temperature must be above 20°F (minus 6.7°C).

- i. Physical Dimensions: 0.02 in. (0.51 mm) thick 59 in. (1.5 m) wide by 102 ft. (31.1 m) and 1.46 oz/ft² (449 g/m²).
- j. Liquid Water Transmission to ASTM D4869: Pass
- k. Fastener Pull-through Resistance: ASTM D3462 – Pass
- l. Nail Sealability: ASTM D1970 / D7349 - Pass
- m. Surface Burning Characteristics: ASTM E84 Flame Spread Index 5, Smoke Developed Index 45

2.05 ACCESSORIES

- A. Sealants, Tapes, and Accessories for Sealing Weather Barrier and Sealing Weather Barrier to Adjacent Substrates: As specified or as recommended by weather barrier manufacturer.
- B. Resilient Rollers for ensuring flatness during installation of self adhered membranes.
- C. Flexible Flashing: Self-adhesive sheet flashing complying with ASTM D1970/D1970M, except slip resistance requirement is waived if not installed on a roof.
- D. Liquid Flashing: One part, fast curing, non-sag, elastomeric, gun grade, trowelable liquid flashing.
 - 1. Manufacturers:
 - a. VaproShield Liquiflash
- E. Stainless Steel Flashing: Flexible flashing with 8 mils, 0.008 inch thick sheet of Type 304 stainless steel, 8 mils, 0.008 inch of butyl adhesive and a siliconized release liner.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and conditions are ready to accept the work of this section.

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 in accordance with manufacturer's instructions.

3.03 INSTALLATION

- A. Install materials in accordance with manufacturer's instructions for best practices.
- B. Air Barriers: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
- C. Vapor Retarders: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces and around all protrusions.
- D. Apply sealants and adhesives within recommended application temperature ranges. Consult manufacturer if temperature is out of this range.
 - 1. Air or Vapor Barrier General practices
 - a. Install sheets shingle-fashion to shed water, with seams generally horizontal.
 - b. Overlap seams as recommended by manufacturer but at least 6 inches.
 - c. Overlap at outside and inside corners as recommended by manufacturer but at least 12 inches.
 - d. For applications specified to be air tight, seal seams, laps, penetrations, tears, and cuts with self-adhesive tape; use only large-headed, gasketed fasteners recommended by the manufacturer.
 - e. Where stud framing rests on concrete or masonry, extend lower edge of sheet at least 6 inches below bottom of framing and seal to foundation with sealant.
 - f. Install air barrier and vapor retarder UNDER jamb flashings unless specifically noted otherwise.
 - g. Install head flashings under weather barrier.
 - h. At openings to be filled with frames having nailing flanges, wrap excess sheet into opening; at head, seal sheet over flange and flashing.
- E. Self-Adhesive Sheets General:

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1. Prepare substrate in manner recommended by sheet manufacturer; fill and tape joints in substrate and between dissimilar materials.
 2. Lap sheets shingle-fashion to shed water and seal laps air tight.
 3. Once sheets are in place, press firmly into substrate with resilient hand roller; ensure that all laps are firmly adhered with no gaps or fishmouths.
 - a. At least two installers must participate at all times in the laying and rolling of the product during installation.
 4. Use same material, or other material approved by sheet manufacturer for the purpose, to seal to adjacent construction and as flashing.
 5. At wide joints, provide extra flexible membrane allowing joint movement.
- F. Openings and Penetrations:
1. Follow manufacturers best practices for opening preparation.
 2. Install flashing over sills, covering entire sill frame member, extending at least 5 inches onto weather barrier or exterior drainage plane and at least 6 inches up jambs; fasten stretched edges. Follow air barrier manufacturer recommendations for details at corners, jamb and sill.
 3. At openings to be filled 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.
 4. At openings to be filled with non-flanged frames, seal weather barrier to all sides of opening framing, using flashing at least 9 inches wide, covering entire depth of framing.
 5. At head of openings, install flashing under weather barrier extending at least 4 inches beyond face of jambs; seal weather barrier to flashing.
 6. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
 7. Service and Other Penetrations: Form flashing around penetrating item and seal to weather barrier surface.
- G. Roof Underlayment Installation
1. Install per manufacturer's recommendations.
 2. If temperature is below 60 degrees F, follow all procedures for cold weather installation including but not limited to:
 - a. Maintaining rolls in a warm environment prior to installation.
 - b. Using primer as recommended by manufacturer.
 - c. Utilizing additional labor personnel to maintain flatness of installation.
 3. Install membranes directly on to clean, dry continuous substrate.
 4. Protrusions from the deck area must be removed.
 5. Decks shall have no voids, damaged, or unsupported areas.
 6. Prime wood and gypsum sheathing with a manufacturer's recommended primer.
 7. Extend underlayment under all roofing, up headwalls and other areas as indicated.
 8. Install in a fashion to promote positive drainage in all cases.
 9. Roll membrane as it is being installed with resilient roller recommended by manufacturer.
 10. No less than two workers shall be attempting installation of roofing underlayment at any time.
 11. Install membrane without wrinkles, pockets, fishmouths or bubbles.
 12. Replace any areas or sheets that are not flat and smooth immediately. Do not continue to shingle and overlap improperly installed material.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Take digital photographs of each portion of the installation prior to covering up including all penetrations in wall or ceiling and all openings.

3.05 PROTECTION

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

END OF SECTION

**SECTION 07 4113
METAL ROOFING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Structural roofing system of preformed aluminum panels.
- B. Attachment system.
- C. Metal Z Furring with ventilation holes between roof sheathing layers.
- D. Finishes.
- E. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 05 1200 - Structural Steel Framing: Roof framing.
- B. Section 05 4000 - Cold formed Metal Framing
- C. Section 06 1000 - Rough Carpentry: Roof sheathing.
- D. Section 07 2100 Thermal Insulation: Roof insulation and thermal barrier
- E. Section 07 2500 Weather Barriers - Roof Underlayment and Vapor Retarders

1.03 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2017a.
- B. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- C. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric) 2014.
- D. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials 2016.
- E. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings 2020a.
- F. ASTM E1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference 2005 (Reapproved 2017).
- G. ASTM E1646 - Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference 2011 (Reapproved 2018).
- H. ASTM E1680 - Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems 2016.
- I. IAS AC472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems 2018.
- J. ICC-ES AC188 - Acceptance Criteria for Roof Underlayments 2012, with Editorial Revision (2015).
- K. ICC-ES AC207 - Acceptance Criteria for Polypropylene Roof Underlayments 2012, with Editorial Revision (2015).
- L. UL 580 - Standard for Tests for Uplift Resistance of Roof Assemblies Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Summary of test results, indicating compliance with specified requirements.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Specimen warranty.
- C. Shop Drawings: Include layouts of roof panels, details of edge and penetration conditions, spacing and type of connections, flashings, underlayments, and special conditions.

1. Show work to be field-fabricated or field-assembled.
 2. Include structural analysis signed and sealed by qualified structural engineer, indicating compliance of roofing system to specified wind and other loading conditions.
- D. Selection Samples: For each roofing system specified, submit color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each roofing system specified, submit samples of minimum size 12 inches square, representing actual roofing metal, thickness, profile, color, and texture.
1. Include typical panel joint in sample.
 2. Include typical fastening detail.
- F. Manufacturer Qualification Statement: Provide documentation showing metal roof panel fabricator is accredited under IAS AC472.
- G. Test Reports: Indicate compliance of metal roofing system to specified requirements.
- H. Warranty: Submit specified manufacturer's warranty and ensure that forms have been completed in Owner's name and are registered with manufacturer.
- I. Contractor to map all locations where hand crimping occurs and provide a roof plan with that information as part of close-out submittal.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than 10 years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least 8 years of documented experience and having at least two projects in the past 5 years of similar project size in Alaska at an off-road system location.
- C. On site workforce to have at least 2 yrs experience installing products similar to this project with same or similar equipment.
- D. Field application of sealants or on-site rolling of panels allowed only with pre-approved quality assurance plan.
1. Example Field Report attached at the end of this section

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Provide strippable plastic protection on prefinished roofing panels for removal after installation.
- B. Store roofing panels on project site as recommended by manufacturer to minimize damage to panels prior to installation.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Finish Warranty: Provide manufacturer's special warranty covering failure of factory-applied exterior finish on metal roof panels and agreeing to repair or replace panels that show evidence of finish degradation, including significant fading, chalking, cracking, or peeling within specified warranty period of twenty years from Date of Substantial Completion.
- C. Waterproofing Warranty: Provide manufacturer's warranty for weathertightness of roofing system, including agreement to repair or replace roofing that fails to keep out water within specified warranty period of 20 years from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 STRUCTURAL METAL ROOF PANELS

- A. Structural Metal Roofing: Provide complete roofing assemblies, including roof panels, clips, fasteners, connectors, and miscellaneous accessories, tested for compliance with the following minimum standards:
1. Structural Design Criteria: Provide panel assemblies designed to safely support design loads at support spacing indicated, with deflection not to exceed $L/180$ of span length(L) when tested in accordance with ASTM E1592.
 2. Overall: Complete weathertight system tested and approved in accordance with ASTM E1592.

3. Wind Uplift: Class 90 wind uplift resistance of UL 580.
 4. Air Infiltration: Maximum .022 cfm/sq ft at air pressure differential of 12 lbf/sq ft, when tested according to ASTM E1680.
 5. Water Penetration: No water penetration when tested according to procedures and recommended test pressures of ASTM E1646. Perform test immediately following air infiltration test.
 6. Thermal Movement: Design system to accommodate without deformation anticipated thermal movement over ambient temperature range of 100 degrees F.
- B. Metal Panels: Site-formed panels, single panel full length from ridge to eave, using coil stock with factory-applied finish.
1. Aluminum Panels:
 - a. Alloy: Aluminum complying with ASTM B209 (ASTM B209M); temper as required for forming.
 - b. Thickness: Minimum 0.40 inch
 2. Profile: Standing seam, with minimum 1.5 inch seam height; concealed fastener system for field seaming with special tool. Verify profile height matches existing roof.
 3. Seam Sealant: Factory apply high-grade butyl mastic sealant within the confines of panel's female leg, designed to seal against adjacent male panel leg.
 4. Alternate field methods are possible with contractor developed quality control plan pre-approved by owner and Architect. See quality control sample document for minimum requirements for field application quality control process.
 5. Clips: Provide clip designed to allow panels to thermally expand and contract. Clip shall incorporate a self-centering feature to allow 1 inch of movement in both directions along panel length. Clip type shall be selected to meet positive and negative pressures as specified.
 6. Trims and Flashings: Material, metal thickness, and finish to match panels. Profiles indicated in Drawings.
 - a. Provide manufacturer's standard accessories and other items essential to completeness of standing seam roof installation.
 7. Panel Texture: Smooth, with intermediate ribs for added stiffness.
 8. Length: Full length of roof slope, without lapped horizontal joints.
 9. Width: Maximum panel coverage of 12 inches.
 10. Panel Penetration Flashings: As recommended by panel manufacturer; designed to provide sufficient movement to prevent creation of points of fixity at penetrations.

2.02 ATTACHMENT SYSTEM

- A. Concealed System: Provide manufacturer's standard stainless steel concealed anchor clips designed for specific roofing system and engineered to meet performance requirements, including anticipated thermal movement.

2.03 FABRICATION

- A. Panels: Provide field fabricated panels factory applied finish and accessory items, using manufacturer's standard processes as required to achieve specified appearance and performance requirements.
- B. Joints: Provide captive gaskets, sealants, or separator strips at panel joints to ensure weathertight seals, eliminate metal-to-metal contact, and minimize noise from panel movements.

2.04 FINISHES

- A. Fluoropolymer Coil Coating System: Manufacturer's standard multi-coat aluminum coil coating system complying with AAMA 2605, including at least 70 percent polyvinylidene fluoride (PVDF) resin, and at least 80 percent of coil coated aluminum surfaces having minimum total dry film thickness (DFT) of 0.9 mil, 0.0009 inch; color and gloss to match existing roof to remain; note that a custom color may be required to achieve a match if not available in manufacturer's standard color range.

2.05 ACCESSORIES

- A. 16 gauge 1 1/2 deep galvanized or stainless steel Z Furring with 1" ventilation holes in vertical web at 3" on center.
 - 1. Location: Between roof sheathing layers: See roof assembly
- B. Miscellaneous Sheet Metal Items: Provide flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, and equipment curbs of the same material, thickness, and finish as used for the roofing panels. Items completely concealed after installation may optionally be made of stainless steel.
 - 1. Roof Ridge and necessary bond breakers for dissimilar metals as required.
 - 2. Mechanical roof curb and crickets
 - 3. Fireplace flue, curb and crickets
 - 4. Storm Collars and flashings finished to match roof.
 - 5. Fascia, eave, and rake trims
 - 6. Curved eave fascia at entry canopy.
- C. Rib and Ridge Closures: Provide prefabricated, close-fitting components of neoprene rubber and prefinished steel.
- D. Field Sealants:
 - 1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.
 - 2. Concealed Sealant: Non-curing butyl sealant or butyl tape sealant
 - 3. Butyl Tape: 3/16" thick and 2" wide typical.
 - 4. Seam Sealant: Factory-applied, non-skinning, non-drying type.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 INSTALLATION

- A. Overall: Install roofing system in accordance with approved shop drawings and panel manufacturer's instructions and recommendations, as applicable to specific project conditions. Anchor all components of roofing system securely in place while allowing for thermal and structural movement.
 - 1. Install roofing system with concealed clips and fasteners, except as otherwise recommended by manufacturer for specific circumstances.
 - 2. Minimize field cutting of panels. Where field cutting is absolutely required, use methods that will not distort panel profiles. Use of torches for field cutting is absolutely prohibited.
- B. Accessories: Install all components required for a complete roofing assembly, including flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, equipment curbs, rib closures, ridge closures, and similar roof accessory items.
- C. Roof Panels: Install panels in strict accordance with manufacturer's instructions, minimizing transverse joints except at junction with penetrations.
 - 1. Form weathertight standing seams incorporating concealed clips, using an automatic mechanical seaming device approved by the panel manufacturer.
 - 2. Seams:
 - a. Panel seams shall interlock entire length of seam.
 - b. Design standing seam to lock up and resist joint disengagement during design wind uplift conditions as calculated according to local building codes.
 - c. Provide pre-installed sealant within confines of panel's female leg to aid in resistance of leaks and provide panel-to-panel seal while allowing expansion and contraction movement.

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- d. Seams shall be continuously locked or crimped together by mechanical means during installation. Seaming tools shall be sourced from manufacturer's recommended vendor.

3.03 CLEANING

- A. Clean exposed sheet metal work at completion of installation. Remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving the work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to the finish.

3.04 PROTECTION

- A. Do not permit storage of materials or roof traffic on installed roof panels. Provide temporary walkways or planks as necessary to avoid damage to completed work. Protect roofing until completion of project.
- B. Touch-up, repair, or replace damaged roof panels or accessories before Date of Substantial Completion.

END OF SECTION

EXAMPLE

Metal Panel Sealant Detailed Daily Quality Control Field Report

Weather:

Reports of any issues from day before and how they were addressed:

Conditions of equipment

Seamer:

Hot melt machine:

Temp of Hot Melt:

Applicator 1:

Role:

Hours of previous experience performing same task as today:

Applicator 2:

Role:

Hours of previous experience performing same task as today:

Applicator 3:

Role:

Hours of previous experience performing same task as today:

Foreman Performing Quality Control:

Hours of previous experience performing same task as today:

Periods of work (Start Time to End Time for each person - Breaks of 30 min or less need not be noted):

Number of panels completed this day and general areas of work (use gridlines):

Note any changes in workforce, equipment, substantial changes in weather (rain, snow, wind) during the periods of work.

Images shall be date and time stamped. Images shall have descriptive filenames and be included in report as jpeg or full page pdf attachments. Example: 18-0721- after break first bead

Images: First bead of sealant of the day as applied.

Image of each panel for full length of seam with sealant prior to crimping

Image of each panel at panel end after crimping.

Image of first bead of sealant in seam after work stoppage of 30 min or more.

Image of first bead of sealant in seam after reloading hopper.

All the above and any additional images to equal no less than one image per hour of work.

Signature and Date Foreman:

Signature and Date UIC Superintendent:

SECTION 07 4623
WOOD SIDING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Horizontal Board siding for exterior walls identified as Siding-1.
- B. Vertical Board siding for exterior wall identified as Siding-2
- C. Fuel tank screen wall including vertical slats, topcaps, rails and accessories.
- D. Plywood Soffit Panels
- E. Trim, flashings, accessories, and fastenings.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Siding substrate and columns for fuel tank screen
- B. 07 2100 Thermal Insulation
- C. Section 07 2500 - Weather Barriers:
- D. Section 07 6200 - Sheet Metal Flashing and Trim:
- E. Section 09 9113 - Exterior Painting: Prime and finish painting.

1.03 REFERENCE STANDARDS

- A. WRCLA Wester Red cedar lumber association 2016 grading rules
- B. APA B840 - 303 Siding Manufacturing Specifications 2019.
- C. APA PRP-108 - Performance Standards and Qualification Policy for Wood Structural Panels (Form E445) 2021.
- D. RIS (GR) - Standard Specifications for Grades of California Redwood Lumber 2019.
- E. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17 2018.
- F. WWPA G-5 - Western Lumber Grading Rules 2017.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating materials, component profiles, fastening methods, jointing details, sizes, surface texture, finishes, accessories, and [_____].
- C. Samples: Two or more boards of at least 36" showing the full range of acceptable knots or defects.

1.05 QUALITY ASSURANCE

- A. Grade lumber in accordance with the following:
 - 1. WRCLA - CLEAR or as defined in this section
 - a. No more than one small tight knot of 1.5" or less in 12 feet of length.
 - b. No more than 25% of boards with knots.
 - 2. APA
 - 3. Redwood: RIS (GR).
 - 4. Western Red Cedar: WCLIB (GR).
- B. Plywood Labeled by APA certified grading agency. Marine Grade.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wood Siding:
 - 1. Basis of Design: Buffalo lumber Co.: Near Clear Grade.

2.02 SIDING AND TRIMS

- A. Finishes
 - 1. See 09 9913 Exterior Painting for finishes.
- B. Siding 1: Horizontal Board Siding: Beveled, cedar, maximum moisture content of 10 percent.
 - 1. Size: 1 inch thick butt, 3/4 inch tip, 8 inch high nominal board with 1 inch lap.

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2. Surface Texture: Sanded four sides S4S
- C. Siding-2: Vertical Board Siding: Square, cedar, maximum moisture content of 10 percent
 1. Size 1 inch x 8"
 2. Surface Texture: Sanded four Sides S4S
- D. Vertical Slats: Cedar
 1. Size: 2x8
 2. Surface Texture: Sanded four Sides S4S
- E. Trim, rails and Top Caps: Cedar
 1. Size: As indicated on drawings.
 2. Surface texture: Sanded four sides S4S
- F. Panel Siding for soffits: Exterior Marine Grade Soffit Panels Grade A-A per APA.
 1. Finish: See Finish Legend

2.03 ACCESSORIES

- A. Screws: Corrosion resistant stainless steel 316 alloy type; non-staining, of size and strength to securely and rigidly retain the work with prefinished heads to match siding. .
- B. Stainless steel 316 angle braces for fuel tank wood screen.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrates are ready to receive work.
- B. Verify that weather barrier has been correctly and completely installed over substrate.
- C. Do not begin until unacceptable conditions have been corrected.
- D. If substrate preparation is the responsibility of another installer, notify Architect and general contractor of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Confirm all materials are primed and have one coat of finish on all four sides.
- B. Do not install materials until all pre-finishing is complete and dry.

3.03 INSTALLATION

- A. Install siding in accordance with manufacturer's instructions.
- B. Fasten siding in place, level and plumb.
 1. Arrange for orderly fastening pattern, blind fasten 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 6.75 inch exposure.
 1. Fasten at each vertical batten.
 2. Miter horizontal joints tight at 45 degrees with a smooth face, miter at inside and outside corners unless indicated otherwise.
- D. Install panel siding sheets with edges and ends over firm bearing.
- E. Sand work smooth and set exposed fasteners.

3.04 TOLERANCES

- A. Maximum Variation From Plumb and Level: 1/4 inch per 10 feet.
- B. Maximum Offset From Joint Alignment: 1/16 inch.

END OF SECTION

SECTION 07 4644
EXTERIOR COMPOSITION RESIN PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Exterior composition panels at soffit and face of main entry.

1.02 RELATED REQUIREMENTS

- A. Section 05 4000 - Cold-Formed Metal Framing: Metal stud wall framing.
- B. Section 06 1000 - Rough Carpentry: , sheathing.
- C. Section 07 2500 - Weather Barriers: Water-resistive barrier.
- D. Section 07 6200 - Sheet Metal Flashing and Trim: Flashing.

1.03 REFERENCE STANDARDS

- A. ASTM D2247-2 Resistance to Water absorption
- B. ASTM E84 Flame and Smoke index
- C. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus 2019.
- D. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates 2021.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturer's data sheets on each product to be used, including:
 - 1. Manufacturer's requirements for related materials to be installed by others.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods, including fastening patterns.
- C. Samples: For each finish product specified, provide material samples representing color, texture, thickness and patterns.
 - 1. Material Sample 6x8 minimum
 - 2. Fasteners and Accessories: Two of each type; full size, and indicate use.
- D. Test Report: Showing compliance with specified performance requirements.
- E. Manufacturer's Qualification Statement.
- F. Warranty: Submit copy of manufacturer's warranty, made out in Owner's name, showing that it has been registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store materials under dry and waterproof cover, well ventilated, and elevated above grade on a flat surface.
- B. Protect materials from harmful environmental elements, construction dust, and other potentially detrimental conditions.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Correct defective work within a two year period after Date of Substantial Completion.
- C. Manufacturer's Warranty: Provide manufacturer's standard warranty of 5 years from Date of Substantial Completion .

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Composite Resin Panel
 - 1. Trespa

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2. FunderMax
3. Parklex

2.02 PRODUCT

- A. Basis of Design : Trespa Facade Panels
 1. Surface Texture: Matte.
 2. Edge Profile: Square.
 3. Thickness: 8mm
 4. Color: As indicated on Finish Legend

2.03 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Comply with local building code in accordance with authorities having jurisdiction (AHJ) for wind load resistance requirements of project location.
- B. ASTM D5420-04 Impact Resistance
- C. Less than 0.5% water absorption per ASTM D2247
- D. Flexural Strength ASTM D790-07 17,500 psi
- E. Density ASTM D792-08 Greater than 1.35 g/cm³
- F. Flame spread less than 25 ASTM E84
- G. Smoke index less than 450 ASTM E84
- H. Surface defects less than 0.0003 square inches per foot

2.04 ACCESSORIES

- A. Fasteners, Polymer-Coated: Polymer-coated #9 composite decking screws complying with ASTM B117 for corrosion-resistance; length as required to penetrate wall sheathing at least 1/4 inch.
- B. Furring strips, clips and Anchors: Provide as indicated in accordance with panel manufacturers recommended installation; conceal unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrate, clean and repair as required to eliminate conditions that would be detrimental to proper installation.
- B. Do not begin until unacceptable conditions have been corrected.
- C. If substrate preparation is responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Install Sheet Metal Flashing: Secure using concealed fastening method in accordance with panel manufacturer's instructions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
 1. Touch-up field cut edges before installing including fine sanding or buffing of edges.
 2. Pre-drill screw holes if necessary to prevent breakage.

3.04 CLEANING

- A. Clean panels in accordance with manufacturer's maintenance instructions, using cleaning materials and methods acceptable to manufacturer.

3.05 PROTECTION

- A. Protect installed products until Date of Substantial Completion.
- B. Repair damage to adjacent substrates and surfaces.
- C. Touch-up, repair, or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fabricated sheet metal items.
- B. All metal flashing to be aluminum 18 gauge, pre-finished unless noted otherwise.

1.02 RELATED REQUIREMENTS

- A. Section 05 50 00 - Metal Fabrications
- B. Section 06 1000 - Rough Carpentry:
- C. Section 07 4113: Metal Roofing
- D. Division 8 - Openings
- E. Section 07 6100 - Sheet Metal Roofing.
- F. Section 07 9200 - Joint Sealants:

1.03 REFERENCE STANDARDS

- A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2014 (2015 Errata).
- B. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2017a.
- C. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2017a.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.
- E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2015.
- F. ASTM B32 - Standard Specification for Solder Metal 2020.
- G. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- H. SMACNA (ASMM) - Architectural Sheet Metal Manual 2012.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene two weeks before starting work of this section.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- C. Verification Samples: Submit two samples [4x4] inch illustrating metal finish color.
- D. Submit samples of all exposed fasteners to be used with color matched heads as required.

1.06 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements and standard details, except as otherwise indicated.
- B. Maintain one copy of document on site.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration, staining, or galvanic corrosion.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

- A. Aluminum: ASTM B209 (ASTM B209M); .040 inch thick; anodized finish of color as selected.
 - 1. Match roofing material, gauge and finish for all roof flashings.
 - 2. Clear Anodized Finish: AAMA 611 AA-M12C22A41 Class I clear anodic coating not less than 0.7 mils thick.
 - 3. Color Anodized Finish: AAMA 611 AA-M12C22A42/44 Class I integrally or electrolytically colored anodic coating not less than 0.7 mils thick. Color as indicated on drawings to match adjacent components.
- B. Pre-Finished Aluminum: ASTM B209 (ASTM B209M) 18 gauge ; plain finish shop pre-coated with modified silicone coating.
 - 1. Modified Silicone Polyester Coating: Pigmented Organic Coating System, AAMA 2603; baked enamel finish system.
 - 2. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system.
 - 3. Color: As selected by Architect from manufacturer's full colors.
- C. Stainless Steel: ASTM A666 Type 316, soft temper 22 gauge, unless indicated otherwise on drawings.

2.02 ACCESSORIES

- A. Fasteners: Stainless steel 316, with soft neoprene washers.
- B. Do not use exposed fasteners unless required.
- C. Heads of exposed fasteners to be finished to match flashing.
- D. Exposed fasteners to be pop rivets unless noted otherwise.
- E. Primer: Zinc chromate type.
- F. Solder: ASTM B32; Sn50 (50/50) type.

2.03 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest possible lengths.
- C. Hem exposed edges on underside 1/2 inch minimum or as indicated; overlap, miter and seam corners.
- D. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- E. Fabricate corners from one piece with minimum 18 inch long legs; tab, overlap and seam for rigidity, seal with sealant.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.
- C. Confirm opening preparation is consistent with contract documents.

3.02 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Protect all concealed metal surfaces from contact with dissimilar metals or other incompatible materials by back priming or through pre-applied coatings protecting against galvanic corrosion.

3.03 INSTALLATION

- A. Conform to drawing details.

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1. If detail not provided, conform to best practices as recommended by industry standards and referenced guidelines.
- B. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted. Locations shall be shown in contract drawings or approved shop drawings.
- C. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- D. Seal metal joints watertight.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for field inspection requirements.
- B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION