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SEALS PAGE

GENERAL

1.01 PROJECT

A. Project Name: ESD-112 - 2300 Building Re-Roof.
B. Address: 2500 NE 65th Avenue.
C. City: Vancouver, WA 98661.

1.02 ARCHITECT

A. Architect’s Name: Ankrom Moisan Architects, Inc.
   1. Portland Office:
      a. 38 NW Davis, Suite 300, Portland, Oregon 97209.
      b. Tel: 503-245-7100.
      c. Fax: 503-245-7710.
   2. Project Manager: Lori Kellow.
   3. Tel: 503) 977 5222.
   4. E-mail: lori@ankrommoisan.com.

END OF SECTION
SECTION 00 01 07.00
SEALS PAGE - STRUCTURAL

GENERAL

1.01 PROJECT
A. Project Name: ESD-112 - 2300 Building Re-Roof.
B. Address: 2500 NE 65th Avenue.
C. City: Vancouver, WA 98661.

1.02 THE FOLLOWING SPECIFICATION SECTIONS HAVE BEEN PREPARED BY:
A. Name: Kramer Gehlen and Associates, Inc.
   1. Address: 400 Columbia Street, Suite #240
   2. City: Vancouver, Washington
   3. Tel: 503-289-2661
   4. Project Manager: Mark Hughes
   5. E-mail: markh@kga.cc
B. Specification Table of Contents:

END OF SECTION
SECTION 00 01 13
PROJECT DIRECTORY

GENERAL

1.01 PROJECT
A. Project Name: ESD-112 - 2300 Building Re-Roof.
B. Address: 2500 NE 65th Avenue.
C. City: Vancouver, WA 98661.

1.02 OWNER
A. Owner's Name: Educational Service District ESD 112.
   1. Address: 2500 NE 65th Avenue.
   2. City: Vancouver, WA 98661.
   3. Tel: 360-952-3482.
   4. Project Manager: Jeff Grimes.
   5. E-mail: jeffery.grimes@esd112.org.

1.03 ARCHITECT
A. Architect's Name: Ankrom Moisan Architects, Inc.
   1. Portland Office:
      a. 38 NW Davis Street, Suite 300, Portland, Oregon 97209.
      b. Tel: 503-245-7100.
      c. Fax: 503-245-7710.
   2. Project Manager: Lori Kellow.
   3. Tel: 503) 977 5222.
   4. E-mail: lorik@ankrommoisan.com.

1.04 STRUCTURAL ENGINEER
A. Name: Kramer Gehlen and Associates, Inc.
   1. Address: 400 Columbia Street, Suite #240
   2. City: Vancouver, Washington
   3. Tel: 503-289-2661
   4. Project Manager: Mark Hughes
   5. E-mail: markh@kga.cc

END OF SECTION
SECTION 00 50 00

CONTRACTING FORMS AND SUPPLEMENTS

PART 1 GENERAL

1.01 AGREEMENT AND CONDITIONS OF THE CONTRACT

A. The General Conditions are based on AIA A201, as amended.

1.02 FORMS

A. Use the following forms for the specified purposes unless otherwise indicated elsewhere in Contract Documents.

B. Clarification and Modification Forms:
   1. Architect's Supplemental Instructions Form: AIA G710.

1.03 REFERENCE STANDARDS

A. AIA A201 - General Conditions of the Contract for Construction; 2017.

B. AIA G701 - Change Order; 2017.


PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 10 00

SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: ESD-112 - 2300 Building Re-Roof
   1. Address: 2500 NE 65th Avenue
   2. City: Vancouver, WA 98661

B. Owner’s Name: Education Service District 112.

C. Architect’s Name: Ankrom Moisan Architects, Inc.
   1. Portland Office:
      a. 38 NW Davis, Suite 300, Portland, Oregon 97209.
      b. Tel: 503-245-7100.
      c. Fax: 503-245-7710.

D. Contract Documents, dated February 10, 2020 were prepared for Project by Ankrom Moisan Architects, Inc.

1.02 DESCRIPTION OF ALTERATIONS WORK

A. Scope of alterations work is indicated on drawings.

1.03 OWNER OCCUPANCY

A. Owner intends to occupy the Project through duration of construction.

B. Cooperate with Owner to minimize conflict and to facilitate Owner’s operations.

C. Schedule the Work to accommodate Owner occupancy.

1.04 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.
   1. During construction period Contractor to have full use of premises for construction operations, including use of site.
   2. Contractor’s use of premises is limited only for Owner’s right to perform work or to retain other contractors on portions of Project.
   3. Keep driveways and entrances serving premises clear and available to Owner, Owner’s employees, and emergency vehicles at all times.

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: Maintain existing building in a weathertight condition throughout construction period.
   1. Repair damage caused by construction operations.
2. Take all precautions necessary to protect building and its occupants during construction period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Procedures for preparation and submittal of applications for progress payments.
B. Documentation of changes in Contract Sum and Contract Time.
C. Change procedures.
D. Correlation of Contractor submittals based on changes.

1.02 DEFINITIONS
A. Architect's Supplemental Instructions (ASI):
   1. Architect's written order of instruction to Contractor, signed by Architect, which authorizes minor changes in Work that do not change Contract Sum or Contract Time.
B. Proposal Request (PR):
   1. Initiated by Architect: Written request by Architect to Contractor to quote change to Contract Sum and/or Contract Time for proposed change to Contract Documents.
   2. Initiated by Contractor: Written request by Contractor to Architect proposing change to Contract Documents accompanied with quotation for change to Contract Sum and/or Contract Time.
C. Construction Change Directive (CCD):
   1. Written order prepared by Architect, signed by Owner and Architect, directing Contractor to proceed with change to Contract Documents which affect Contract Sum and/or Contract Time, for subsequent inclusion in a Change Order after change to Contract Sum and/or Contract Time has been determined.
D. Change Order (CO):
   1. Prepared by Architect and signed by Owner, Contractor, and Architect stating their agreement to a change to Contract Documents and adjustment to Contract Sum and/or Contract Time.

1.03 SCHEDULE OF VALUES
A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.
B. Forms filled out by hand will not be accepted.
C. Submit a printed schedule on AIA Form G703 - Application and Certificate for Payment Continuation Sheet. Contractor's standard form or electronic media printout will be considered.
D. Correlate line items in Schedule of Values with other required administrative schedules and forms, including:

Project Number 195390
1. Contractor's Construction Schedule.
2. Application for Payment forms, including Continuation Sheets.
3. List of Subcontractors, principle suppliers, and fabricators.
4. Schedule of allowances.
5. Schedule of alternates.

E. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section. Identify site mobilization.
   1. Identification: Include following Project identification on Schedule of Values:
      a. Project name and address.
      b. Name of Architect.
      c. Project number.
      d. Contractor's name and address.
      e. Date of submittal.
   2. Arrange Schedule of Values in tabular form with separate columns to indicate following for each item listed:
      a. Related Specification Section or Division.
      b. Description of Work.
      c. Name of subcontractor.
      d. Name of manufacturer or fabricator.
      e. Name of supplier.
      f. Change Orders (numbers) that affect value.
      g. Dollar value; Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
   3. Provide a breakdown of Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports.
   4. Round amounts to nearest whole dollar; total to equal Contract Sum.
   5. Provide a separate line item for each part of Work where Applications for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed.
   6. Update and resubmit Schedule of Values prior to next Applications for Payment when Change Orders or Construction Change Directives result in a change in Contract Sum.

F. Include separately from each line item, a direct proportional amount of Contractor's overhead and profit.

G. Revise schedule to list approved Change Orders, with each Application For Payment.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.
B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
C. Forms filled out by hand will not be accepted.
D. Present required information in typewritten form.
E. Form: AIA G702 Application and Certificate for Payment and AIA G703 - Continuation Sheet including continuation sheets when required.

F. Initial Application for Payment:
   1. Administrative actions and submittals that must precede or coincide with this application include following:
      a. List of subcontractors.
      b. List of principal suppliers and fabricators.
      c. Schedule of Values.
      d. Contractor's Construction Schedule.
      e. List of Contractor's staff assignments.
      f. List of Contractor's principal consultants.
      g. Copies of building permits.
      h. Initial progress report.
      i. Report of preconstruction meeting.
      j. Certificates of insurance and insurance policies.
      k. Performance and payment bonds.
      l. Data needed to acquire Owner's insurance.

G. Application for Payment at Substantial Completion: Following issuance of Certificate of Substantial Completion, submit an Application for Payment.
   1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of Work.
   2. Administrative actions and submittals that must precede or coincide with this application include following:
      a. Occupancy permits and similar approvals.
      b. Warranties (guarantees) and maintenance agreements.
      c. Test/adjust/balance records.
      d. Maintenance instructions.
      e. Final cleaning.
      f. Application for reduction of retainage and consent of surety.
      g. Advice on shifting insurance coverage.
      h. List of incomplete Work recognized as exceptions to Architect's Certificate of Substantial Completion.

H. Final Payment Application:
   1. Administrative actions and submittals that must precede or coincide with this application include following:
      a. Completion of Project closeout requirements.
      b. Completion of items specified for completion after Substantial Completion.
      c. Ensure that unsettled claims will be settled.
      d. Ensure that incomplete Work is not accepted and will be completed without undue delay.
      e. Transmittal of required Project construction records to Owner.
      f. Proof that taxes, fees, and similar obligations were paid.
      g. Removal of temporary facilities and services.
      h. Removal of surplus materials, rubbish, and similar elements.
i. Change of door locks to Owner's access.

I. Execute certification by signature of authorized officer.
   1. Complete every item of form. Include notarization and execution by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
   a. Match entries with data on Schedules of Values.
   b. Include amounts of Change Orders and Construction Change Directives issued prior to last day of construction period covered by application.

J. Submit one electronic and one hard-copies of each Application for Payment.

K. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.05 MODIFICATION PROCEDURES

A. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in Contractor's employ or subcontractors of changes to Contract Documents.

B. For minor changes not involving an adjustment to the Contract Price or Contract Time, Architect will issue instructions directly to Contractor.

C. Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by the Conditions of the Contract by issuing Architect's supplemental instructions (ASI) on AIA Form G710 or other similar form designated by Architect.

D. Architect's Supplement Instructions (ASI).
   1. Architect's Supplemental Instructions may include supplementary or revised Drawings and/or Specifications to describe minor changes.

E. Construction Change Directive (CCD): Architect may issue a directive, on AIA Form G714 Construction Change Directive or other similar form designated by Architect, signed by Architect, instructing Owner to proceed with a change in the Work, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2. Construction Change Directive may include supplementary or revised Drawings and/or Specifications to describe change to the Contract Documents
   3. Promptly execute the change.
   4. Both Owner and Architect will sign and date a Construction Change Directive which directs the Contractor to proceed with change to the Contract Documents prior to determination of cost and/or time.
   5. Contractor shall submit to Architect itemized change to Contract Sum and/or Contract Time within 10 working days when possible, and no more than 30 calendar days, except for the following conditions:
a. Unit prices have been agreed upon and quantities cannot be determined until work described in the CCD has been completed.
b. Owner has agreed that Contract Sum and/or Contract Time of can be determined at completion of work described in the CCD.
6. When Owner, Architect, and Contractor concur on change to Contract Sum and/or Contract Time, as described in the General Conditions for “Construction Change Directives,” the change to Contract Sum and/or Contract Time will be included in a Change Order.
7. Construction Change Directive is issued in lieu of a Proposal Request when time is of the essence and change to Contract Sum and/or Contract Time cannot be determined prior to start of the work.

F. Proposal Request (PR): Architect may issue a document which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 10 days.
  1. Proposal Request is a request for information only, and is not an instruction or authorization to execute the change, or an order to stop Work in progress.
  2. Proposal Request may include supplementary or revised Drawings and/or Specifications to describe a proposed change to Contract Documents.

G. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation. Document any requested substitutions in accordance with Section 01 60 00.
  1. Proposal Request is for a change in the Work accompanied by a detailed quotation of impact on Contract Sum and/or Contract Time.
  2. Proposal Request may include revised Drawings and/or Specifications to describe a proposed change to Contract Documents.
  3. Proposal Request is a request for information only, and does not authorize the Contractor to execute the change or stop Work in progress without the Architect's and Owner's authorization.
  4. Contractor initiated Proposal Requests may take the form of a “Claim” where Contractor finds it necessary for proper execution of the Work, to propose a change in the Work that is not shown or indicated in Contract Documents, and may affect Contract Sum and/or Contract Time, which for which no Proposal Request or Construction Change Directive has been issued by the Architect.
    a. Contractor's determination that Architect's response to an RFI which affects Contract Sum and/or Contract Time may be addressed by Contractor in a Proposal Request.
  5. Architect shall respond to Contractor initiated proposals within 10 working days following receipt of Proposal Request.

H. Change Orders (CO):
1. Architect will prepare each Change Order utilizing AIA Document G701, or other similar form acceptable to Owner.
2. Stipulated Sum Change Order: Based on Proposal Request or Notice of Change and Contractor's price quotation or Contractor's request for a Change Order as approved by Architect.

I. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
3. For pre-determined unit prices and quantities, the amount will be based on the fixed unit prices.
4. For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.
5. Proposal Requests approved for change to Contract Documents by Owner and Architect that have not been converted to a Construction Change Directive.
6. Construction Change Directive where Owner, Architect, and Contractor have agreed to change in Project Contract Sum and/or Contract Time.
7. Changes to Project Contract Sum and/or Contract Time that have not been documented by Proposal Request or Construction Change Directive, but have been agreed upon by Owner, Architect, and Contractor.

J. Substantiation of Costs: Provide full information required for evaluation.
1. On request, provide the following data:
   a. Quantities of products, labor, and equipment.
   b. Taxes, insurance, and bonds.
   c. Overhead and profit.
   d. Justification for any change in Contract Time.
   e. Credit for deletions from Contract, similarly documented.
2. Support each claim for additional costs with additional information:
   a. Origin and date of claim.
   b. Dates and times work was performed, and by whom.
   c. Time records and wage rates paid.
   d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
   e. Products, with quantities used and unit cost, including purchase source.
   f. Taxes, Insurance, and Bonds.
   g. Credit for deleted work where applicable with same documentation as required for cost increases for additional work.
   h. Overhead and profit, determined after credits have been deducted from additions.
   i. Justification for change in Contract Time.
3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
4. Claims for Work not authorized through Proposal Requests or Construction Change Directives:
   a. Provide supporting documentation for each claim for additional cost as indicated above for cost and time quotations with the following additional information:
   b. Name of Owner's authorized agent who ordered work, and date of Order.
   c. Dates and hours work performed, and by whom.
   d. Timecard records, including summary of hours worked, and hourly rates paid.
   e. Receipts and invoices for products used including quantities and unit costs.
   f. Receipts and invoices for equipment utilized, including dates and time of use.
   g. Provide the same documentation indicated above for subcontracts same as required for Contractor's own forces.

K. Unit Price Change Order:
   1. For pre-determined unit prices and quantities, Change Order will be executed on a fixed unit price basis.
   2. For unit costs or quantities of units of work which are not pre-determined, execute work under a Construction Change Directive.
   3. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.

L. Time and Material Change Order:
   1. Submit itemized account and supporting data after completion of change, within time limits indicated in Conditions of Contract.
   3. Maintain detailed record so work done on Time and Material basis.
   4. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in work.

M. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

N. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

O. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

P. Promptly enter changes in Project Record Documents.

Q. Document requests for Product substitutions according to requirements of Section 01 60 00.

Project Number 195390
1.06 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:
   1. All closeout procedures specified in Section 01 70 00.

1.07 CORRELATING CHANGE ORDERS WITH OTHER REQUIREMENTS

A. Revise Schedule of Values and Applications for Payment to record each Change Order as separate item of work with adjustment to Contract Sum and Contract Time as described herein.

B. Revise Construction Schedule to reflect each change in Contract Time.

C. Revise Subschedules to show changes for other items of work affected by modifications to Contract Documents.

D. Record modifications in Record Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 22 00
UNIT PRICES

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. List of unit prices, for use in preparing Bids.
   B. Measurement and payment criteria applicable to Work performed under a unit price payment method.

1.02 SUBMITTALS
   A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
   B. Submit documented quantities, unit pricing and total cost in form of Change Orders.

1.03 COSTS INCLUDED
   A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.04 UNIT QUANTITIES SPECIFIED
   A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

1.05 MEASUREMENT OF QUANTITIES
   A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.
   B. Take all measurements and compute quantities. Measurements and quantities will be verified by Owner.
   C. Assist by providing necessary equipment, workers, and survey personnel as required.
   D. Measurement by Area: Measured by square dimension using mean length and width or radius.

1.06 PAYMENT
   A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.

1.07 DEFECT ASSESSMENT
   A. Replace Work, or portions of the Work, not complying with specified requirements.
   B. If, in the opinion of Owner, it is not practical to remove and replace the Work, Owner will direct one of the following remedies:
1. The defective Work may remain, but the unit price will be adjusted to a new unit price at the discretion of Owner.
2. The defective Work will be partially repaired to the instructions of the Owner, and the unit price will be adjusted to a new unit price at the discretion of Owner.

C. The authority of Owner to assess the defect and identify payment adjustment is final.

1.08 SCHEDULE OF UNIT PRICES
A. Item 1: Unit Price to remove and replace existing roof sheathing deemed unsuitable due to rot or water damage by engineer of record.; Section 06 10 00 Rough Carpentry.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

3.01 PREPARATION
A. Coordinate work and document quantity of units.

END OF SECTION
SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative requirements.
B. Electronic document submittal service.
C. Preconstruction meeting.
D. Contract documents precedence.
E. Pre-Installation Meeting.
F. Progress meetings.
G. Construction progress schedule.
H. Progress photographs.
I. Coordination drawings.
J. Submittals for review, information, and project closeout.
K. Number of copies of submittals.
L. Requests for Interpretation (RFI) procedures.
M. Submittal procedures.
N. Layout of work.
O. Field engineering.

1.02 DEFINITIONS

A. Coordination Drawings:
   1. Show relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in space provided or to function as intended.

B. Product Data:
   1. Printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.

C. Samples:
   1. Partial sections of manufactured or fabricated components, cuts or containers of material, color range sets, and swatches showing color, texture, and pattern.

D. Field samples:
   1. Full-sized physical examples erected on-site to illustrate finishes, coatings, or finish materials.
2. Samples used to establish standard by which Work will be judged.

E. Mockups:
1. Full-size assemblies for review of construction, coordination, testing, or operation; they are not Samples.
2. Approved mockups will be used to establish standard by which Work will be judged and maybe allowed to remain as part of the permanent Work.

1.03 CONTRACT DOCUMENTS PRECEDENCE

A. In event of conflict or discrepancy among the Contract Documents, interpretations will be based on the following order of priorities:
   1. Agreement
   2. Addenda, with those of later date having precedence over those of earlier date.
   3. Supplementary Conditions.
   4. General Conditions of the Contracts.
   5. Schedules.
      a. In the case of inconsistency between Drawings and Specifications or within either Document not clarified by Addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation.
      b. Large Scale Drawings.
      c. Small Scale Drawings.
   7. Dimension numbers written on Drawings prevail and take precedence over Dimensions scaled from Drawings.

1.04 PROJECT COORDINATOR

A. Coordinate construction operations included in various Sections of these Specifications to assure efficient and orderly installation of each part of The Work.
   1. Schedule construction operations in sequence required to obtain best results where installation of one part of Work depends on installation of other components.
   2. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
   3. Coordinate storage or staging areas for all trades.

B. Administrative Procedures:
   1. Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of Work.
   2. Administrative activities include, but are not limited to:
      a. Preparation of Schedules.
      b. Installation of temporary facilities.
      c. Delivery and processing of submittals.
      d. Progress meetings.
      e. Project closeout activities.
C. Staff Names: Within 15 days of commencement of construction operations, submit a list of Contractor's principal staff assignments, including superintendent and other personnel involved in daily Project activities.
   1. Identify individuals, their duties and responsibilities.
   2. List personnel addresses and telephone numbers.

D. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

E. Conservation: Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water, and materials.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
   1. Besides submittals for review, information, and closeout, this procedure applies to Requests for 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. Contractor and Architect are required to use this service.
   3. It is Contractor's responsibility to submit documents in allowable format.
   4. Subcontractors, suppliers, and Architect's consultants will be permitted to use the service at no extra charge.
   5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
   6. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
   7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

B. Submittal Service: The selected service is:
   1. Newforma Info Exchange:
      a. Project access: Invitation to be provided by Architect.

C. Training: Web-based video tutorials are available on the site.
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. Schedule a meeting after notice to proceed.

B. Schedule meeting at a time convenient to Owner and Architect, but not later than 15 days after Notice of Award.
   1. Hold conference at Project site or other convenient location.

C. Attendance Required:
   1. Owner.
   3. Contractor.
   4. Superintendent.
   5. Subcontractors.
   6. Manufacturer’s Technical Representative.

D. Agenda:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
   5. Designation of personnel representing the parties to Contract and Architect.
      a. Emergency off-hour contacts.
   7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   8. Scheduling.
      a. Critical work sequencing.
   9. Purpose of Request for Interpretation (RFI):
      a. Determine information not included in Contract Documents.
      b. RFI is not intended to address:
         1) Design changes affecting time and/or price.
         2) Frivolous items.
         3) Items not related to Scope.

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

3.03 PRE-INSTALLATION MEETING

A. Conduct Pre-Installation Conference before each activity that requires coordination with other construction activities. Specification Sections requiring Pre-Installation Conferences include:
1. 06 16 00 - Sheathing
2. 07 54 13 - Thermoplastic Membrane Roofing (TPO)

B. Attendance Required:
   1. Owner.
   3. Contractor.
   4. Building envelope consultant
   5. Installer foreman
   6. Manufacturer's technical representative.
   7. Code enforcement personnel, if required by local codes (example: Section 07 84 00, Firestopping.

C. Notifications:
   1. Notify attendees of scheduled Conference a minimum of 7 calendar days in advance of the conference.

D. Agenda:
   1. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
   3. Procedures and processing of field decisions, submittals, and substitutions.
   4. Scheduling.
   5. Scheduling and preparation for activities of other trades.
   6. Review progress of time schedules, manufacturer's preparation and installation recommendations, safety requirements, weather limitations, substrate acceptability, compatibility problems, and inspection and testing requirements.
   7. Review progress of other construction activities and preparations for particular activity under consideration, including requirements for following:
      b. Shop Drawings, Product Data, and Quality Control Samples.
      c. Details
      d. Mockups.
      e. Possible conflicts or compatibility problems.
      f. Weather limitations.
      g. Manufacturer's preparation and installation recommendations.
      h. Warranty requirements.
      i. Substrate acceptability.
      j. Governing regulations.
      k. Inspecting and testing requirements.
      l. Protection.
   8. Record significant discussions, agreements, and disagreements of each conference.
      It is recommended that this meeting be held either preceding or following a Progress Meeting.
      a. Number and record meetings sequentially.
b. Distribute meeting record to concerned parties, including Architect and Owner, within 72 hours after meeting.

E. Do not proceed with installation if meeting cannot be successfully concluded.
   1. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene conference at earliest feasible date.

3.04 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the work at maximum bi-monthly intervals.

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

C. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Architect, as requested.
   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.
   6. Review of off-site fabrication and delivery schedules.
   7. Maintenance of progress schedule.
   8. Corrective measures to regain projected schedules.
   9. Planned progress during succeeding work period.
  10. Coordination of projected progress.
  11. Maintenance of quality and work standards.
  12. Effect of proposed changes on progress schedule and coordination.
  13. Other business relating to work.

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

3.05 CONSTRUCTION PROGRESS SCHEDULE

A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
1. Include written certification that major Subcontractors have reviewed and accepted proposed schedule.
2. Include Product Submittal Review Schedule, provide date of submittal, length of design team review and resubmittal time.
3. Submittals submitted prior to an approved Product Submittal Schedule will be returned without action.

D. Within 10 days after joint review, submit complete schedule.

E. Provide updated schedule at each OAC meeting.

3.06 PROGRESS PHOTOGRAPHS

A. Submit 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.

C. In addition to periodic, recurring views, take photographs of each of the following events:
   1. Foundations in progress and upon completion.
   2. Structural framing in progress and upon completion.
   3. Enclosure of building, upon completion.
   4. Final completion, minimum of ten (10) photos.

D. Views:
   1. Provide non-aerial photographs from four cardinal views at each specified time, until date of Substantial Completion.
   2. Consult with Architect for instructions on views required.
   3. Provide factual presentation.
   4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

E. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
   1. Delivery Medium: Via email.
   2. File Naming: Include project identification, date and time of view, and view identification.
   3. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.
   4. Hard Copy: Printed hardcopy (grayscale) of PDF file and point of view sketch.

3.07 COORDINATION DRAWINGS

A. Prepare coordination drawings where coordination is needed for installation of products and materials fabricated by separate entities.
   1. Prepare coordination drawings where limited space availability necessitates maximum utilization of space for efficient installation of different components.

B. Review drawings prior to submission to Architect.
3.08 REQUESTS FOR INTERPRETATION (RFI)

A. Definition:
1. A request for interpretation (RFI) will not impact time and/or cost. If the Contractor believes the response will impact time and/or cost, see 3.10.G.
2. A request for interpretation (RFI) is seeking one of the following:
   a. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.

B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.

C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
1. Prepare a separate RFI for each specific item.
   a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
   b. Provide a proposed solution.
   c. Do not forward requests which solely require internal coordination between subcontractors.
2. Prepare using software provided by the Electronic Document Submittal Service.
3. Combine RFI and its attachments into a single electronic file.PDF format is required.

D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
1. Include in each request Contractor’s signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
2. Unacceptable Uses for RFIs: Do not use RFIs to request the following:
   a. Approval of submittals (use procedures specified elsewhere in this section).
   b. Approval of substitutions (see Section - 01 60 00 - Product Requirements)
   d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).
   e. Documenting field conversations.
3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required
to clarify the question. They will be returned without a response, with an explanatory notation.

   a. The Owner reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Architect, and any of its consultants, due to processing of such RFIs.

E. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
   1. Number RFI’s sequentially from "001".
   2. Record each RFI in a log, identifying each by RFI-#, subject, date submitted, date of response, and disposition. Update and distribute log at project meetings.
   3. Indicate current status of every RFI. Update log promptly and on a regular basis.
   4. Note dates of when each request is made, and when a response is received.
   5. Highlight items requiring priority or expedited response.

F. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
   1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.

G. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor’s belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
   1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
   2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
   3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
   4. 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.

3.09 SUBMITTAL SCHEDULE

A. Submit to Architect for review and approval, a schedule for submittals in tabular format.
   1. Coordinate with Contractor’s construction schedule and schedule of values.
   2. Adjust submittal schedule to correspond with adjustment made to the construction schedule.
      a. Schedule submittals so as to allow for a reasonable amount of time for Architect to process and review.
   3. Format schedule to allow tracking of status of submittals throughout duration of construction.

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4. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.

5. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
   a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

### 3.10 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system.

B. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products that are not required or proposed for Work, clearly mark copies to indicate applicable information.

C. Include following information:
   1. Manufacturer’s printed recommendations.
   2. Compliance with trade association standards.
   3. Compliance with recognized testing agency standards.
   4. Performance characteristics and capacities.
   5. Notation of dimensions verified by field measurement.
   6. Required clearances, wiring and piping diagrams, and controls.
   7. Manufacturer’s standard schematic drawings and diagrams, modified as required to suit Project requirements.
   8. Notation of coordination requirements.

D. Colors and Patterns:
   1. Except where specific color and pattern is indicated in Contract Documents, and whenever a choice of color or pattern is available in specified products, submit 2 color and pattern charts to Architect for selection.

E. Submit following for each required submittal:
   1. 2 copies for Architect.
   2. Number of copies as required for Maintenance manuals.
   3. Number of copies as required by Contractor for distribution.

F. Architect will retain 2 copies and return remainder, marked with action taken and corrections or modifications required, to Contractor for distribution.
   1. Contractor to retain number of copies required for maintenance manuals.
   2. Do not permit use of unmarked copies of Product Data in connection with construction.

### 3.11 SAMPLES

A. Submit Samples for review of size, kind, color, pattern, and texture, and to illustrate functional and aesthetic characteristics of Product, clearly mark samples to indicate applicable information.
B. Where variation in color, pattern, or texture, or other characteristic is inherent in material or product represented, submit at least 3 multiple units that show approximate limits of variations, or number of units indicated in individual specification Sections.

C. Field Samples: Full-size examples erected on-site to illustrate finishes, coatings, or finish materials and to establish Project standard.

3.12 QUALITY ASSURANCE SUBMITTALS

A. Submit quality control submittals, including:
   1. Design data  
   2. Certifications  
   3. Manufacturer's instructions  
   4. Manufacturer's field reports  
   5. Other quality control submittals required under individual Technical Specifications of Project Manual.

B. Certifications: Where individual Technical Specifications Sections of Project Manual require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from manufacturer certifying compliance with specified requirements.
   1. Certification to be signed by an officer of manufacturer or other individual authorized to sign documents on behalf of company.

3.13 DESIGN DRAWINGS: DELEGATED DESIGN COMPONENTS

A. Make design Drawings accurately to a scale sufficiently large to show pertinent aspects of item and its method of connection to Work.

B. Provide structural calculation stamped by structural engineer registered in state work is being performed.

3.14 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit in a single bookmarked PDF for review:
   1. Product data.  
   2. Shop drawings.  
   3. Samples for selection.  
   4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.
3.15 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. Coordination Drawings.
   8. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner.

3.16 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 78 00 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Other types as indicated.

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

3.17 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; two of which will be retained by Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.
   3. Additional number of samples as required by Contractor for distribution.
      a. Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of Work.

C. Copies will be returned, marked with Architect's action taken and corrections or modifications required, to Contractor for reproduction and distribution.
   1. Do not permit use of unmarked Shop Drawings in connection with construction.

3.18 SUBMITTAL PROCEDURES

A. General Requirements:
1. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
   a. Retain numbering system throughout revisions with addition of sequential letters for each revision to initial submittal.
2. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
3. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
   a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
   b. Identify deviations from Contract Documents, and Product or system limitations which may be detrimental to successful performance of completed Work.
   c. Architect will return submittals without action if Contractor has not coordinated submittal and applied signature prior to transmittal to Architect.
4. Schedule submittals to expedite the Project, and coordinate submission of related items.
   a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
   b. For sequential reviews involving Architect's consultants, Owner, or another affected party, allow an additional 7 days.
5. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
6. Provide space for Contractor and Architect review stamps.
7. When revised for resubmission, identify all changes made since previous submission.
8. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
9. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
10. Submittals not requested will not be recognized or processed.

B. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
2. Do not reproduce Contract Documents to create shop drawings.
3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

C. Coordination:
1. Coordinate preparation and processing of submittals with performance of construction activities.

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a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
   1) Transmit each submittal sufficiently in advance to avoid delay of related construction activities.
2. Coordinate transmittal of submittals for related elements of Work so processing will not be delayed by need to review submittals concurrently for coordination.
   a. Architect reserves right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
   b. Partial submittals may be rejected as not complying with these provisions of Contract.
3. Coordinate and ensure that no Work is performed that is involved with submittal until receiving Architect’s stamped and signed approval.
4. Architect will not accept submittals received from sources other than Contractor.
5. Reference submittal to pertinent Contract Drawing sheet and detail number(s), and Contract Specification Section number.
6. Submit items pertaining to only one Specification Section in each submittal.

D. Submittal log:
1. Submit submittal log listing all submittals and date to be submitted at first construction meeting.
2. Submit log itemizing project submittals and project submission date one week prior to first submittal.
3. Identify each submittal.
4. Maintain an accurate submittal log for duration of Work, showing current status of submittals at all times.
5. Log to be reviewed at weekly meeting.
   a. Make log available to Owner and Architect for review upon request.

3.19 SUBMITTAL REVIEW

A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.

B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.

C. Architect’s actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.

D. Architect’s and consultants’ actions on items submitted for review:
1. Authorizing purchasing, fabrication, delivery, and installation:
   a. "Approved", or language with same legal meaning.
   b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
      1) At Contractor’s option, submit corrected item, with review notations acknowledged and incorporated.
   c. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
2. Not Authorizing fabrication, delivery, and installation:
E. Architect's and consultants' actions on items submitted for information:
   1. Items for which no action was taken:
      a. "Received" - to notify the Contractor that the submittal has been received for record only.
   2. Items for which action was taken:
      a. "Reviewed" - no further action is required from Contractor.

3.20 ARCHITECT’S ACTION

A. Except for submittals for record or information, where action and return is required, Architect will review each submittal, mark to indicated action taken, and return to Contractor.

B. Action Stamp: Architect will stamp each submittal with an action stamp, and mark stamp appropriately to indicate action taken, as follows:
   1. NO EXCEPTION TAKEN:
      a. Final Unrestricted Release: Work covered by submittal may proceed provided it complies with requirements of Contract Documents.
      b. Final payment depends on that compliance.
   2. MAKE CORRECTIONS NOTED:
      a. Final-But-Restricted Release: Work covered by submittal may proceed provided it complies with corrections on submittal and requirements of Contract Documents.
      b. Final payment depends on that compliance.
   3. REVISE AND RESUBMIT:
      a. Returned for Resubmittal: Do not proceed with Work covered by submittal, including purchasing, fabrication, delivery, or other activity.
      b. Revise or prepare a new submittal according to notations and resubmit. Repeat as necessary to obtain a mark releasing submittal.
      c. Do not use, or allow others to use, submittals marked REVISE AND RESUBMIT, at Project site or elsewhere where Work is in progress.
   4. REJECTED:
      a. Rejected from use: Work or product covered may NOT proceed or be used.
   5. SUBMIT SPECIFIED ITEM:
      a. Contractor to submit specified product.
   6. Other Action: Where a submittal is for information or record purposes or special processing or other activity, Architect will return submittal marked RECORD DOCUMENT.

C. DELEGATED DESIGN COMPONENT REVIEW:
   1. Architect will stamp submittal after it has been reviewed by contractor.
   2. Actions as specified under Action Stamp apply in addition to the following:
      a. REVIEWED FOR COMPATIBILITY WITH THE DESIGN OF THE BUILDING.
      b. REVIEWED TO DETERMINE WHETHER SYSTEMS, MATERIALS OR EQUIPMENT ARE DESIGNED IN CONFORMANCE WITH THE PERFORMANCE AND DESIGN CRITERIA AND THE DESIGN CONCEPT EXPRESSED IN THE CONTRACT DOCUMENTS.

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D. Unsolicited Submittals: Architect will return unsolicited submittals to sender without action.

3.21 LAYOUT OF WORK

A. Survey and verify conditions of project site.

B. Record existing conditions prior to construction for comparison with Contract Documents.
   1. Report conflicts to Architect prior to start of Work.
   2. Architect will provide revisions to Contract Documents or issue instructions to deal with conflicts.
   3. Be responsible for remedying conflicts which could have been prevented by timely reviews of existing conditions.
   4. Remedies, which vary from Contract Documents shall be approved by Architect's and Owner's Representatives.

3.22 FIELD ENGINEERING

A. Engineering Services:
   1. Provide field engineering services as required for construction.
   2. Locate and maintain an accurate benchmark on or near site which has been established by a Registered Surveyor.
      a. Relate subsequent elevations of finish grades and building elements directly to this benchmark.

B. Existing Control Points:
   1. Protect control points prior to starting Work, and preserve permanent reference points during construction.
   2. Make no changes or relocations of control points without prior written notice to Architect's Representative.
   3. Report to Architect's Representative when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

C. Instrument Layout:
   1. Using site bench marks and existing elevation control points, establish lines and levels, located and laid out by survey instrumentation.
   2. Locate water supply, storm and sanitary sewer lines.
   3. Locate edge and level of paving, curbs, walks, and sloping landscape.
   4. Locate building foundations, column locations, and floor levels.
   5. Locate controlling lines and levels required for plumbing, mechanical and electrical Work within 5 feet of building perimeter.

D. Corrections:
   1. Record changes in elevations or location of Work on project record Documents.
   2. Report errors in horizontal and vertical dimensions and grades prior to starting Work.

E. Verification:
   1. Verify dimensions of new and existing Work.
a. If field measurements differ slightly from Drawings, modify to accommodate. If field measurements differ significantly, notify Architect prior to commencing Work.

2. Coordinate locations of openings through floors, roofs and walls with Architectural, Mechanical and Electrical Drawings.

F. Documentation:
1. Submit documentation to verify accuracy of field engineering Work when requested by Architect.

END OF SECTION
SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.
B. Quality Control Coordinator.
C. Quality Control Requirements.
D. Testing and inspection agencies and services.
E. Manufacturers' field services.
F. Defect Assessment.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Quality Control Plan:
   1. Preconstruction Meeting: Submit for approval a written Contractor Quality Control (CQC) plan prior to meeting.
      a. Plan to be used for agenda.
   2. Contractor shall submit for approval a revised written plan within 14 days after pre-installation meeting.
   3. Changes to plan during contract period as necessary to obtain quality specified to be through agreement between Architect, Owner and Contractor.
   4. No change in approved plan may be made without written concurrence by Contractor, Owner and Architect.
   5. Include following:
      a. List of personnel responsible for quality control and assigned duties. Include each person’s qualifications.
      b. Copy of a letter of direction to Contractor’s Quality Control Supervisor outlining assigned duties.
      c. Methods of performing, documenting, and enforcing quality control of work.
   6. Contractor’s Quality Control Daily Reports: Submit inspections and tests on first workday following date covered by report.
   7. Test Reports (Owners Testing Lab):
      a. Submit Daily Test Information Sheets with Quality Control Daily Reports.
      b. Submit failing test results and proposed remedial actions within four hours of noted deficiency.
      c. Submit three copies of complete test results not later than three calendar days after test was performed.
   8. Off-Site Inspection Reports: Submit prior to shipment.
C. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.

D. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
1. Include:
   a. Date issued.
   b. Project title and number.
   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. Compliance with Contract Documents.
   k. When requested by Architect, provide interpretation of results.

E. Certificates: When specified in individual specification sections, submit certification by manufacturer and Architect or installation/application subcontractor to Architect, in quantities specified for Product Data.

F. 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.

G. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
1. Submit report in duplicate within 30 days of observation to Architect for information.
2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

H. Shop Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.

1.03 QUALITY ASSURANCE

A. General:
1. Quality of work: Contractor's responsibility.
2. Testing: Responsibility of an Owner's independent testing laboratory
3. Inspect and test Work often enough to ensure that quality of materials, workmanship, construction, finish, and functional performance is in compliance with applicable specifications and drawings.
4. Quality Control Daily Reports shall be completed by Quality Control Supervisor.
5. Test reports shall be completed by person performing test.
6. Architect may designate locations of tests.

B. Quality Control Coordinator:
   1. Contractor's Quality Control Coordinator shall be assigned no other duties.
      a. Coordinator shall responsible for work coordination of Building Envelope.
   2. Contractor's jobsite supervisory staff may be used to assist the Quality Control Contractor, supplemented as necessary by additional personal.
   3. Contractor's designated Quality Control Coordinator or competent supplementary personal shall be on the project site whenever contract work is in progress.

1.04 TESTING AND INSPECTION AGENCIES AND SERVICES

   A. Owner will employ and pay for services of an independent testing agency to perform specified testing and inspection.

   B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ON-SITE - QUALITY CONTROL REQUIREMENTS

   A. Notification:
      1. Notify Architect at least 48 hours in advance of preparatory phase meeting.
      2. Notify Architect at least 24 hours in advance of the initial and follow-up phases.

   B. Preparatory Phase: Perform before beginning each feature of work.
      1. Review submittal requirements with personnel directly responsible for the quality control work. As a minimum, Contractor's Quality Control Supervisor and foreman responsible for the feature of work shall be in attendance.
      2. Review applicable specifications sections and drawings related to feature of work.
      3. Ensure that copies of referenced standards related to sampling, testing, and execution for feature of work are available on site.
      4. Ensure that provisions have been made for field control testing.
      5. Examine work area to ensure that preliminary work has been completed.
      6. Verify field dimensions and advise the Architect of discrepancies with contract documents.
      7. Ensure that necessary equipment and materials are at project site and that they comply with approved shop drawings and submittals.

   C. Initial Phase:
      1. As soon as work begins, inspect and test a representative portion of a particular feature of work for quality of workmanship.
      2. Review control testing procedures to ensure compliance with contract requirements.
3. Prepare a report on initial phase activities and discussions. Attach report to Contractor’s Quality Control Daily Report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.

D. Follow-Up Phase: Inspect and test as work progresses to ensure compliance with contract requirements until completion of work.

E. Additional Preparatory and Initial Phases: Additional preparatory and initial phases may be required on same feature of work for following reasons:
   1. Quality of on-going work is unacceptable.
   2. Changes occur in applicable quality control staff, on-site production supervision, or work crew.
   3. Work on a particular feature of work is resumed after a substantial period of inactivity.

3.02 TESTING AND INSPECTION

A. See individual specification sections for testing required.

B. Testing Agency Duties:
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
   5. Perform additional tests and inspections required by Architect.
   6. The approved testing agency shall select samples of materials to be tested at random; the contractor shall not select the samples.
   7. Submit reports of all tests/inspections specified.

C. 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.

D. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers’ facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
c. To facilitate tests/inspections.

d. To provide storage and curing of test samples.

4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.

5. Arrange with Owner’s agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

E. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

F. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

G. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect. Payment for re-testing will be charged to the Contractor by deducting testing charges from the Contract Price.

1. If second test conforms to specifications, then Owner will pay for cost of second test.

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 equipment as applicable, and to initiate instructions when necessary.

B. Submit qualifications of observer to Architect 10 days in advance of required observations.

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 complying with specified requirements.

END OF SECTION
SECTION 01 42 16
DEFINITIONS AND REFERENCE STANDARDS

PART 1  GENERAL

1.01  SUMMARY

A. Section supplements the definitions contained in the General Conditions.

B. Other definitions are included in individual specification sections.

1.02  DEFINITIONS

A. Approved:
   1. When used in conjunction with Architect’s action on Contractor’s submittals, applications, and requests, is limited to Architect’s duties and responsibilities as stated in Conditions of Contract.


C. Directed:
   1. Terms such as “directed,” “requested,” “authorized,” “selected,” “approved,” “required,” and “permitted” mean directed by Architect, requested by Architect, and similar phrases.

D. Furnish:
   1. Means to supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

E. Indicated:
   1. Refers to graphic representations, notes, or schedules in Drawings; or to other paragraphs or schedules in Specifications and similar requirements in Contract Documents.
   2. Terms such as “shown,” “noted,” “scheduled,” and “specified” are used to help user locate reference. Location is not limited.

F. Install:
   1. Describes operations at Project site including actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

G. Installer:
   1. Contractor or another entity engaged by Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations.
   2. Installers are required to be experienced in operations they are engaged to perform.
   3. Term “experienced” when used with term “installer” means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
H. Owner: Means owner of project or his agent when applicable.

I. Product:
   1. 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.
   2. Products may be new, never before used, or re-used materials or equipment.

J. Project Manual:
   1. Book-sized volume that includes procurement requirements (if any), contracting requirements, and specifications.

K. Project site:
   1. Space available to Contractor for performing construction activities, either exclusively or in conjunction with others performing other work as part of Project.

L. Provide:
   1. Means to furnish and install, complete and ready for intended use.

M. Regulations:
   1. Includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within construction industry that control performance of Work.

N. Testing Agencies:
   1. Independent entities engaged to perform specific inspections or tests, either at Project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.03 PROJECT MANUAL

A. Divisions in Project Manual conform roughly to customary trade practice.
   1. This is done for convenience and shall not relieve Contractor of responsibility of furnishing every item indicated or specified whether properly segregated or not.

B. No responsibility will be assumed by Owner or Architect for omission or duplications by Contractor in completion of contract due to arrangement of material in Project Manual.

1.04 QUALITY ASSURANCE

A. For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard of date of issue specified in the individual specification sections, except where a specific date is established by applicable code.

C. Should specified reference standards conflict with Contract Documents, request clarification from the Architect before proceeding.
1.05 REFERENCES AND STANDARDS

A. Minimum Quantity or Quality Levels: Quantity or quality level shown or specified shall be minimum provided or performed.

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.

1.06 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

A. In event of conflict or discrepancy among the Contract Documents, interpretations will be based on the following priorities:
   1. Agreement.
   2. Addenda, with those of later date having precedence over those of earlier date.
   3. Supplementary Conditions.
   4. General Conditions of the Contracts.
   5. Schedules.
   6. Drawings and Specifications:
      a. In the case of inconsistency between Drawings and Specifications or within either Document not clarified by Addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation.
      b. Large Scale Drawings.
      c. Small Scale Drawings.
   7. Dimension numbers written on Drawings prevail and take precedence over Dimensions scaled from Drawings.

1.07 SPECIFICATION FORMAT AND CONTENT EXPLANATION (MF04)

A. Divisions in Project Manual conform CSI MasterFormat 2004 and roughly to customary trade Work Results.

B. MasterFormat 2004 edition numbering revision explained:
   1. One of the most significant changes in the MasterFormat 2004 Edition is the adoption of a six-digit numbering system in place of the familiar five-digit system that has been used in MasterFormat since the 1978 edition.
   2. MasterFormat 2004 six-digit numbering system provides exponentially more expansion spaces per level than the five-digit system, all but eliminating concerns about future expansion.

C. MasterFormat 2004 Section Format is as follows:
   1. MasterFormat 2004 has adopted a six-digit numbering system in place of the familiar five-digit system that has been used in MasterFormat since the 1978 edition.
   2. Section Format numbering system of 11 22 33 is used in this specification. Other Section Format numbering systems that maybe used by consultants are 11 2233 or 112233. In all cases the numbering system shall be deemed the same and interchangeable within the Project Manual.
3. MasterFormat Divisions have been increased from 16 Divisions to 50 Divisions, with Divisions 00, 01 and 03-14 basically the same and the following revised:
   a. Division 02 – Existing Conditions:
      1) This division is now limited to “existing conditions,” construction practices that relate to items at the site at the commencement of work – selective demolition, subsurface and other investigation, surveying, site decontamination, and site remediation, among others.
      2) Material has been relocated to Divisions 30-39 in the Site and Infrastructure Subgroup. All site construction as well as heavy civil and infrastructure subject matter, including utility and pavement work are included in this Subgroup.
   b. Division 15 – Mechanical:
      1) Division 15 has been reserved for future expansion
      2) Material has been relocated to Division 22 – Plumbing and Division 23 – Heating, Ventilating, and Air Conditioning in the Facility Services Subgroup, Divisions 20-29.
   c. Division 16 - Electrical:
      1) Division 16 has been reserved for future expansion
      2) Material has been relocated to Division 26 – Electrical and Division 27 – Communications in the Facility Services Subgroup Divisions 20-29.
   d. For additional information on MasterFormat 2004 see www.csinet.org/masterformat.

D. MasterFormat 2004 numbering system use is encouraged for all parties. If using previous version of MasterFormat in submittals or application for payment, then use the following format:
   1. 00 11 22(01122), where the MasterFormat 2004 number is used first, followed by the old five-digit MasterFormat-95 number in parentheses.

E. Project Manual is done for convenience and shall not relieve Contractor of responsibility of furnishing every item indicated or specified whether segregated or not.

F. No responsibility will be assumed by Owner or Architect for omission or duplications by Contractor in completion of contract due to arrangement of material in Project Manual.

G. Specification Content:
   1. Abbreviated Language:
      a. Language used in Specifications and other Contract Documents is abbreviated.
      b. Words and meanings shall be interpreted as appropriate.
      c. Words implied, but not stated, shall be interpolated as sense requires.
      d. Singular words shall be interpreted as plural, and plural words as singular, where applicable as context indicates.
   2. Imperative mood and streamlined language are generally used in Specifications.
      a. Requirements expressed in imperative mood are to be performed by Contractor.
b. Subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by Contractor, or by others when so noted.

c. Words “shall,” “shall be,” or “shall comply with,” depending on context, are implied where a colon (:) is used within a sentence or phrase.

END OF SECTION
SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Temporary utilities.
B. Temporary telephone service.
C. Temporary sanitary facilities.
D. Temporary Controls: Barriers, enclosures, and fencing.
E. Vehicular access and parking.
F. Waste removal facilities and services.
G. Project identification sign.
H. Field offices.

1.02 RELATED REQUIREMENTS
A. Section 01 35 53 - Security Procedures

1.03 REFERENCE STANDARDS
B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 QUALITY ASSURANCE
A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to:
   1. Building code requirements.
   2. Health and safety regulations.
   3. Utility company regulations.
   4. Police and fire department rules.
   5. Environmental protection regulations.
B. Standards: Comply with following:
   1. NFPA 241.
C. Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70.
D. Inspections:
1. Arrange for authorities having jurisdiction to inspect and test each temporary utility before use.
2. Obtain required certifications and permits.

1.05 TEMPORARY UTILITIES

A. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.

B. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to type of fuel being consumed.

C. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces.
   1. In other locations, provide hand-carried, portable, UL-rated, Class ABC dry-chemical extinguishers or a combination of extinguishers of NFPA recommended classes for exposures.

D. Temporary Fire Protection:
   1. Install and maintain temporary fire protection facilities of types needed to protect against reasonably predictable and controllable fire losses until permanent fire protection facilities are operable.
   2. Comply with NFPA 10 and NFPA 241.
   3. Store combustible materials in containers in fire safe locations.
   4. Maintain unobstructed access to fire protection equipment.
   5. Provide supervision of welding operation, combustion type temporary heating units, and similar sources of fire ignition.

1.06 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Provide self-contained, single-occupant toilet units of chemical, aerated recirculation or combustion type.
   1. Provide units properly vented and fully enclosed with a fiber-glass-reinforced polyester shell or similar non-absorbent material.

C. Wash Facilities:
   1. Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up.
   2. Dispose of drainage properly. Supply cleaning compounds.
   3. Provide safety showers, eyewash fountains and similar facilities for safety and sanitation of personnel.

D. Drinking Water Facilities:
   1. Provide containerized tap-dispenser bottled-water type drinking water units.

E. Maintain daily in clean and sanitary condition.

F. At end of construction, return facilities to same or better condition as originally found.
G. Rodent and Pest Control:
1. Retain an exterminator or pest control company to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests.
2. Employ this service to perform extermination and control procedures at regular intervals so that Project will be free of pests and their residues at Substantial Completion.

1.07 LIFT AND HOISTS

A. Temporary Lifts and Hoists:
1. Provide facilities for hoisting materials and employees.
2. Truck cranes and similar devices used for hoisting materials are considered “tools and equipment” and not temporary facilities.
3. Temporary Elevator Use: Refer to Division 14 Sections for elevators.

1.08 FENCING

A. Construction: Contractor’s option.

B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.
1. Enclose entire site or portion determined sufficient to accommodate construction operations to prevent people, dogs, and other animals from easily entering site, except by entrance gates.

1.09 EXTERIOR ENCLOSURES

A. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior, including roof and exposed floors without roof covering.
1. Vertical Openings: Close openings with plywood or similar materials.
   a. Provide temporary weather protection, remove standing and ponding water as soon as possible to prevent water damage.
3. Install tarpaulins securely using fire-retardant-treated wood framing and other materials.
4. Where temporary wood or plywood enclosure exceeds 100 sq. ft. in area, use fire-retardant-treated material for framing and main sheathing at fire rated walls, otherwise use any temporary weather protection material.

B. 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.
1.10 INTERIOR ENCLOSURES
   A. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:

1.11 SECURITY
   A. Coordinate with Owner's security program.

1.12 VEHICULAR ACCESS AND PARKING
   A. Coordinate access and haul routes with governing authorities and Owner.
   B. Temporary Paving:
      1. Construct and maintain temporary roads and paving to accommodate traffic during construction period.
         a. Locate where same permanent facilities will be located; review proposed modifications to permanent paving with Architect.
   C. Provide and maintain access to fire hydrants, free of obstructions.
   D. Provide means of removing mud from vehicle wheels before entering streets.
   E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

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

1.14 PROJECT IDENTIFICATION
   A. Provide project identification sign of design and construction indicated on drawings.
   B. Prepare signs to provide directional information to construction personnel and visitors.
   C. No other signs are allowed without Owner permission except those required by law.

1.15 FIELD OFFICES
   A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.
   B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.
   C. Storage and Fabrication Sheds:
1. Install storage and fabrication sheds sized, furnished, and equipped to accommodate materials and equipment involved.

1.16 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 facilities used during construction to original condition.

1.17 PROJECT CONDITIONS

A. Keep temporary services and facilities clean and neat in appearance.

B. Operate in a safe and efficient manner.

C. Relocate temporary services and facilities as Work progresses.

D. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.

1.18 TERMINATION AND REMOVAL

A. Remove each temporary facility when need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion, unless otherwise requested by Owner or Architect.

B. Materials and facilities that constitute temporary facilities are Contractor’s property.
   1. Owner reserves right to take possession of Project identification signs.

C. Remove temporary paving not intended for or acceptable for integration into permanent paving.
   1. Where temporary paving has occurred in areas intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill of subsoil in area.
      a. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawn.
   2. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by governing authority.

D. Substantial Completion: Clean and renovate permanent facilities used during construction period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. General product requirements.
B. Transportation, handling, storage and protection.
C. Product option requirements.
D. Substitution limitations.

1.02 DEFINITIONS
A. Products: Items purchased for incorporation in Work.
   1. Term “product” includes terms “material,” “equipment,” “system,” and terms of similar intent.
   2. “Named Products” are items identified by manufacturer's product name, including make or model number or other designation, listed in manufacturer's published product literature.
B. The term; 'Basis of Design', is used when a single product or system has been researched by the Architect and incorporated into the drawings and project manual. Generally the attributes for the Basis of Design are very specific. Listed manufacturers that are not the Basis of Design must compare those specific attributes and demonstrate that the quality and performance is comparable to or exceeds the product or system specified as basis of design.
C. Materials: Products shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of Work.
D. Equipment: Product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

1.03 SUBMITTALS
A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
   1. Submit within 15 days after date of Agreement.
   2. For products specified only by reference standards, list applicable reference standards.
B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

1.04 QUALITY ASSURANCE

A. Source Limitations: Provide products of same kind from a single source to fullest extent possible.

B. Compatibility of Products: When given option of selecting products, Contractor is responsible for providing products and construction methods that are compatible with previously selected products and construction methods, or products specified to with those selected products to be compatible.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products according to manufacturer’s recommendations.

B. Schedule delivery to minimize long-term storage at site.

C. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, or other losses.

D. Deliver products to site in an undamaged condition in manufacturer’s original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.

E. Inspect products upon delivery to ensure compliance with Contract Documents and to ensure that products are undamaged and properly protected.

F. Store products at site in a manner that will facilitate inspection and measurement of quantity or counting of units.

G. Store products subject to damage by weather above ground, under cover in a weathertight enclosure, and with ventilation adequate to prevent condensation.
   1. Maintain temperature and humidity within range required by manufacturer’s instructions.

PART 2 PRODUCTS

2.01 NEW PRODUCTS

A. Product Substitutions:
   1. Where products or manufacturers are named and accompanied by term equal, approved, or approved equal, comply with Product Substitution Procedures to obtain approval of an unnamed product.

B. Provide new products unless specifically required or permitted by Contract Documents.
C. Specified Standards, Codes, and Regulations: Where compliance with an imposed code, standard, or regulation is specified, provide a product that complies with that code, standard, or regulation.

D. Visual Matching:
   1. Where matching a sample, Architect's decision will be final on whether a proposed product matches satisfactorily.

E. Visual Selection:
   1. Where product requirements include phrase “as selected from manufacturer's standard colors, patterns, textures, ..” or a similar phrase, Architect will select color, pattern, and texture from product line selected that complies with other specified requirements.

2.02 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only:
   1. Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers:
   1. Use a product of one of the manufacturers named and meeting specifications no options or substitutions allowed.

C. Proprietary Specification Requirements:
   1. Single product or manufacturer is named, provide product indicated.
   2. No substitutions are permitted.

D. Semi-proprietary Specification Requirements:
   1. Where two or more products or manufacturers are named, provide one of products indicated that complies with Specifications.
   2. No substitutions are permitted.

E. Specified Standards, Codes, and Regulations: Where compliance with an imposed code, standard, or regulation is specified, provide a product that complies with that code, standard, or regulation.

F. Inappropriate Product Selections:
   1. If Contractor believes specified product, method, or system is inappropriate for use, Contractor to notify Architect before performing Work in question.
   2. If notice of objection is not received prior to delivery to site, it will be assumed by Owner that Contractor agrees specified products, methods, and systems are appropriate for use in Project.

PART 3 EXECUTION

3.01 INSTALLATION OF PRODUCTS

A. Comply with manufacturer's instructions and recommendations for installation of products in applications indicated.
   1. Anchor each product securely in place, accurately located and aligned with other Work.
2. Clean exposed surfaces and protect as necessary from damage and deterioration.

B. Should job conditions or specified requirements conflict with Manufacturers' instructions, consult Architect for further instructions.

3.02 SUBSTITUTION LIMITATIONS

A. Definitions:

1. Substitutions are considered only when proposed alternate is demonstrated as similar or greater value to what was specified. Address the following:
   a. The term; 'Basis of Design', is used when a single product or system has been researched by the Architect and incorporated into the drawings and project manual. Generally the attributes for the Basis of Design are very specific. Proposed Substitutions for Basis of Design must compare those specific attributes and demonstrate that the quality and performance is comparable to or exceeds the product or system specified.
   b. Provide a two column chart showing attributes for proposed substitution comparing those values to specified product or system.
   c. Provide a mark up of the design documents indicating how changes of proposed product or system will be required.

2. Substitutions: Contractor proposals for changes in products, materials, equipment, and methods of construction required by Contract Documents made during bidding and after award of Contract are considered to be requests for substitution.

3. Following are not considered to be requests for substitution for both Pre and Post Award:
   a. Revisions to Contract Documents requested by Owner or Architect.
   b. Specified options of products and construction methods included in Contract Documents.
   c. Contractor's determination of and compliance with regulations and orders issued by governing authorities.

B. Substitutions received before execution of Contract will be processed as Addenda, if accepted, prior to execution of Contract, and thereafter included in Contract Documents.

C. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without compliance with procedures outlined below, or when acceptance will require revision to the Contract Documents.

1. Where manufacturers, products, or systems listed in Specifications are not followed with "or approved" or "Substitutions: Provide in accordance with requirements of Section 01 60 00" it is intended that substitutions are not permitted.

D. Contractor's Responsibilities

1. Contractor's responsibilities for substitution requests made after award of Contract are as follows:
   a. Investigate proposed products and determine they are equal or superior in respects to products specified.
   b. Provide same guarantee for accepted substitutions as for products specified.
c. Make changes in, and coordinate, Work as may be required to incorporate and install accepted substitutions.

d. Waive claims for additional costs which subsequently become apparent which are related to substitutions.

E. Architect will consider request for substitutions no less than 10 working days prior to Bid Date, unless otherwise stipulated in Instructions to Bidders.

F. Equality of different materials or products shall be determined by methods set forth in this Section.
   1. No product or material shall be arbitrarily presumed to be "equal" without having first been so judged by appropriate procedures.
   2. Provide comparison chart itemizing specified parts or components of specified and proposed substitutions.
      a. First column of chart is the specified product, second column is proposed product. Each row is a specified attribute or important attribute to performance.
   3. Comparative analysis to be evaluated by Architect or Engineer approving substitution.
      a. Architect will be sole judge of acceptability of any proposed substitution and decision is final.

3.03 SUBSTITUTIONS REQUESTED AFTER AWARD OF CONTRACT

A. Substitutions received after award of Contract: Requests for substitution received after award Contract will not be considered, except as a Contractor's Request for Change.
   1. Architect will be sole judge of acceptability of any proposed substitution.
   2. Substitutions reviewed in this manner will be processed as Change Orders, if accepted.

B. Architect will receive and consider Contractor's request for substitution after award of Contract when one or more of following conditions are satisfied, as determined by Architect. If following conditions are not met, Architect will return requests without action except to record noncompliance with these requirements.
   1. Specified product cannot be provided within Contract time.
      a. Architect will not consider request of products that: cannot be provided as a result of failure to pursue product promptly or coordinate activities properly.
   2. Specified product cannot receive necessary approval by a governing authority, and requested substitution can be approved.
   3. Specified product cannot be coordinated with other materials and Contractor certifies that proposed substitution can be coordinated.
   4. Specified product cannot provide required warranty and Contractor certifies that proposed substitution provides warranty.
   5. Requested substitution offers Owner a substantial advantage in cost, time, or other considerations after deducting additional Owner's cost of compensation to Architect for redesign and evaluation services, increased cost of other construction, and similar considerations.
C. Contractor's submittal and Architect's acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

D. Substitution Submittal Procedure (after contract award):
   1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
      a. Submit request for approval of a substitution on CSI Substitution Request Form, copy included at end of this Section

3.04 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.

3.05 STORAGE AND PROTECTION

A. Schedule delivery to minimize long-term storage at site.

B. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 74 19.

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

D. Store with seals and labels intact and legible.

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

F. For exterior storage of fabricated products, place on sloped supports above ground.
G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

H. Comply with manufacturer’s warranty conditions, if any.

I. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
   1. Maintain temperature and humidity within range required by manufacturer’s instructions.

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
TO: ____________________________________________

PROJECT: _______________________________________

SPECIFIED ITEM: ________________________________

SECTION ______ PAGE____ PARAGRAPH____________

DESCRIPTION: ___________________________________

PROPOSED SUBSTITUTION

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request including identification of applicable data portions.

Attached data also includes description of changes to contract documents and proposed substitution requires for proper installation.

UNDERSIGNED CERTIFIES FOLLOWING ITEMS, UNLESS MODIFIED BY ATTACHMENTS, ARE CORRECT:

1. Proposed substitution does not affect dimensions shown on drawings.

2. Undersigned pays for changes to building design, including engineering design, detailing, and construction costs caused by proposed substitution.

3. Proposed substitution has no adverse effect on other trades, construction schedule, or specified warranty requirements.

4. Maintenance and service parts available locally or readily obtainable for proposed substitution.

UNDERSIGNED FURTHER CERTIFIES FUNCTION, APPEARANCE, AND QUALITY OF PROPOSED SUBSTITUTIONS ARE EQUIVALENT OR SUPERIOR TO SPECIFIED ITEM.

UNDERSIGNED AGREES TO TERMS AND CONDITIONS FOR SUBSTITUTIONS FOUND IN BIDDING DOCUMENTS TO THIS PROPOSED SUBSTITUTION.

Submitted By: __________________________________

Name (Printed or typed) General Contractor (if after award of Contract)

SIGNATURE: __________________ FOR USE BY A/E ______________

FIRM NAME: _______________ ___APPROVED ___APPROVED AS NOTED

ADDRESS: _______________ ___NOT APPROVED ___RECEIVED TOO LATE

CITY, STATE, ZIP: _______________ BY: ______________________

DATE: _______________________

TEL: ________________ REMARKS: ______________________
SECTION 01 70 00
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 REFERENCE STANDARDS


1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1. On request, submit documentation verifying accuracy of survey work.
   2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
   3. Submit surveys and survey logs for the project record.
C. 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.
5. Work of Owner or separate Contractor.

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

1.04 QUALIFICATIONS

A. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of surveyor’s Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,

B. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in the State in which the Project is located. Employ only individual(s) trained and experienced in establishing and maintaining horizontal and vertical control points necessary for laying out construction work on project of similar size, scope and/or complexity.

C. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

1.05 PROJECT CONDITIONS

A. Protect site from puddling or running water.

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

C. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
   1. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.

D. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.

E. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.06 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.
C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering
existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

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

3.03 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 ten days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.
B. Promptly notify Architect of any discrepancies discovered.
C. 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. Grid or axis for structures.
I. Periodically verify layouts by same means.
3.05 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer’s written installation instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as indicated.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.

B. 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.

C. Services (Including but not limited to HVAC, Plumbing, Fire Protection, and Electrical):
   Remove, relocate, and extend existing systems to accommodate new construction.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
   2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
   3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
      a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
      b. Provide temporary connections as required to maintain existing systems in service.
D.  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.

E.  Adapt existing work to fit new work: Make as neat and smooth transition as possible.
   1.  When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.

F.  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.

G.  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.

H.  Clean existing systems and equipment.

I.  Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

J.  Do not begin new construction in alterations areas before demolition is complete.

K.  Comply with all other applicable requirements of this section.

3.07  **CUTTING AND PATCHING - See Section 01 73 29.**

3.08  **PROGRESS CLEANING**

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

B.  Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C.  Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D.  Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.09  **PROTECTION OF INSTALLED WORK**

A.  Protect installed work from damage by construction operations.

B.  Provide special protection where specified in individual specification sections.
C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.10 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

D. Verify that wiring and support components for equipment are complete and tested.

E. Execute start-up under supervision of applicable Contractor personnel and manufacturer’s representative in accordance with manufacturers’ instructions.

F. 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.

G. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.11 DEMONSTRATION AND INSTRUCTION

A. Demonstrate operation and maintenance of products to Owner’s personnel two weeks prior to date of Substantial Completion.

B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

D. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner’s personnel.
3.12 ADJUSTING
A. Adjust operating products and equipment to ensure smooth and unhindered operation.

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

3.14 CLOSEOUT PROCEDURES
A. Make submittals that are required by governing or other authorities.
   1. Provide copies to Architect and Owner.
B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.
C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.
D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.
E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.
F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.
H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

3.15 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION
SECTION 01 73 29
CUTTING AND PATCHING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Requirements for cutting, fitting, and patching of Work required to:
   1. Make several parts fit properly.
   2. Uncover work to provide for installing, inspecting, or both, of ill-timed work.
   3. Remove and replace work not conforming to requirements of Contract Documents.
   4. Remove and replace defective work.

1.02 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Written Proposal: Where cutting and patching involves structural elements, submit proposal describing procedures. Include following information in proposal:
   1. Describe extent of cutting and patching required, how it will be performed, and why it cannot be avoided.
   2. Indicate changes to structural elements, and changes in appearance of visual elements. Include structural calculations.
   3. List products proposed for use and entities that will perform the Work.
   4. Indicate dates that work will be performed, duration of Work, and when work will be uncovered for Architect's observation.
   5. List utilities that cutting and patching work will affect.
   6. Submit cost estimate and secure Architect's approval of cost estimate and type of reimbursement before proceeding with cutting and patching

1.03 QUALITY ASSURANCE
A. Structural Work:
   1. Do not cut and patch structural elements in a manner that would change their load carrying capacity of load deflection ratio.
   2. Obtain approval before cutting and patching structural elements.
B. Do not cut and patch operating elements in a manner that would reduce their capacity to perform as intended, cause increased maintenance, or decreased operational life or safety.
C. Do not cut and patch exposed elements of construction that in Architect's opinion would reduce visual aesthetic qualities, or result in visual evidence of cutting and patching.
   1. Remove and replace construction cut and patched in a visually unacceptable manner.

1.04 WARRANTY
A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
B. Cut and patch construction using methods and with materials in such a manner as to not void any warranties required or existing.
PART 2 PRODUCTS

2.01 MATERIALS
A. Use new materials identical to existing materials.
B. Exposed surfaces: Where identical materials are not available, use materials that visually match existing adjacent surfaces as nearly as possible.
C. Use materials whose installed performance is equal or better to that of existing materials.

PART 3 EXECUTION

3.01 INSPECTION
A. Inspect existing conditions, including elements subject to movement or damage during cutting, excavating, patching, and backfilling.
B. After uncovering Work, inspect conditions affecting installation of new Work.
C. Discrepancies: If uncovered conditions are not as anticipated, immediately notify Architect and secure direction before proceeding further.
   1. Do not proceed until unsatisfactory conditions are corrected.

3.02 PREPARATION
A. Provide temporary support of work to be cut, including shoring and bracing as required to maintain structural integrity of Work.
B. Protect existing construction during cutting and patching to prevent damage.

3.03 PERFORMANCE
A. Use skilled workers trained and experienced in necessary crafts and familiar with requirements and methods required to restore surfaces to their original condition.
B. Perform excavating and backfilling in accordance with applicable requirements of Division 2 Sections of these Specifications.
C. Provide dust proof barriers where necessary to protect existing surfaces.

3.04 CUTTING
A. Execute cutting and patching to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.
B. Execute work by methods to avoid damage to other work, and which will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
C. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
D. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

E. When masonry construction must be pierced, furnish and install a steel pipe sleeve in opening and grout in place neatly.
   1. Leave grout surface to match existing finish.
   2. Fabricate sleeve one inch in diameter larger than pipe or insulation.
   3. Back and caulk between sleeve and pipe with waterproof sealant.
   4. At penetrations of fire-resistant rated walls, partitions, ceiling, or floor construction: Seal voids with fire-resistant rated materials as required to maintain assembly of fire-resistant rating of penetrated element, or as required by Building Code.

F. Restore work with new products in accordance with requirements of Contract Documents.

G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

H. 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.

I. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

J. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.

K. Patch or replace surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. Repair substrate prior to patching finish. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.05 PATCHING

A. Restore work with new products in accordance with requirements of Contract Documents.
   1. Perform fitting and adjusting of products to provide a finished installation complying with tolerances and finishes specified for type of construction involved.
   2. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

B. Refinish surfaces to match existing adjacent finish, patching with seams that are durable and as invisible as possible.
   1. Where possible, inspect and test patched area to demonstrate integrity of seam.
   2. For continuous surfaces, refinish to nearest intersection or natural break.
   3. For assembly, refinish entire unit.
   4. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining work in manner that will eliminate evidence of patching and refinishing.
C. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.

D. Patch or replace surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. Repair substrate prior to patching finish. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

E. Where replacement of equipment and fixtures is required, restore existing plumbing, heating, ventilation, air-conditioning, electrical, and similar systems to full operational condition.

F. When finished surfaces are cut so that smooth transition with existing or new work is not possible, submit to Architect, for approval, recommendation for terminating surface along straight line at natural line of division.
   1. Where change of plane of 1/4 inch or more occurs, submit to Architect, for approval, recommendation for providing smooth transition.

3.06 CLEANING

A. Clean areas and spaces where cutting and patching work is performed.

END OF SECTION
SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. Owner requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

D. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
   1. Aluminum and plastic beverage containers.
   2. Corrugated cardboard.
   3. Wood pallets.
   4. Clean dimensional wood.
   5. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
   7. Gypsum drywall and plaster.
  11. Rigid foam insulation.

E. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, 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. 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.

G. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.03 SUBMITTALS

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

B. Landfill Alternatives Proposal: Within 10 calendar days after receipt of Notice of Award of Bid, or prior to any trash or waste removal, whichever occurs sooner, submit a projection of trash/waste that will require disposal and alternatives to landfi‌lling, with net costs.
   1. Waste Management Plan: Submit draft plan with landfill alternatives as outlined herein.
PART 2 PRODUCTS

2.01 PRODUCT SUBSTITUTIONS

A. See Section 01 60 00 - Product Requirements for substitution submission procedures.

B. For each proposed product substitution, submit the following information in addition to requirements specified in Section 01 60 00:
   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 Sum.

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

A. See Section 01 20 00 - Price and Payment Procedures: Payment procedures.
   1. Submit with each Application for Progress Payment a Summary of Waste Generated by the Project.
   2. Failure to submit this information shall render the Application for Payment incomplete and shall delay Progress Payment.
   3. Summary shall be submitted on a form acceptable to the Owner and shall contain the following information:
      a. Amount of waste (in tons) landfilled from the Project, the identity of the transfer station/landfill, the total amount of tipping fees paid at the landfill, the transportation cost, and the total disposal cost. Include manifests, weight tickets, receipts, and invoices.
      b. For each material recycled, reused, or salvaged from the Project, the amount (in tons), the date removed from the jobsite, the receiving party, the transportation cost, the amount of any money paid or received for the recycled or salvaged material, and the net total cost or savings of salvage or recycling each material. Attach manifests, weight tickets, receipts, and invoices.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. 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.

C. Meetings: Discuss trash/waste management goals and issues at project meetings.
   2. Include subcontractors affected by the Waste Management Plan as well as Owner designated representative(s).
3. Preconstruction meeting.
4. Regular job-site meetings.

D. 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. As a minimum, provide:
      a. Separate area for storage of materials to be reused on-site, such as wood cut-offs for blocking.
      b. Separate dumpsters for each category of recyclable.
      c. Recycling bins at worker lunch area.
   2. Provide containers as required.
   3. Provide adequate space for pick-up and delivery and convenience to subcontractors.
   4. If an enclosed area is not provided, clearly lay out and label a specific area on-site.
   5. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

E. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

F. 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.

G. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

H. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION
SECTION 01 78 00
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Project Record Documents.
B. Operation and Maintenance Data.
C. Warranties and bonds.
D. Inspection procedures

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

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 SUBSTANTIAL COMPLETION
A. Prior to requesting inspection for certification of Substantial Completion, complete following.
   1. In Application for Payment that coincides with, or first follows, date of Substantial Completion is claimed, show 100 percent completion for portion of Work claimed as substantially complete.
a. Include supporting documentation for completion as indicated in these Contract Documents.
b. If 100 percent cannot be shown, include a list of incomplete items, value of incomplete construction, and reasons Work is not complete.

2. Advise Owner of pending insurance changeover requirements.
3. Submit warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
4. Obtain and submit releases enabling Owner unrestricted use of Work and access to services and utilities.
   a. Include occupancy permits.
5. Submit:
   a. Record Drawings
   b. Record Specifications
   c. Maintenance manuals
   d. Final project photographs
   e. Damage or settlement surveys
   f. Property surveys
   g. Other final record information.
6. Deliver tools, spare parts, extra stock, and similar items.
7. Make final changeover of permanent locks and transmit keys to Owner.
   a. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems and instruction to Owner's operation and maintenance personnel.
9. Discontinue and remove temporary facilities from site, along with mockups, construction tools, and similar elements.
10. Complete final cleanup requirements.
11. Touch up and otherwise repair and restore marred, exposed finishes, including touchup painting.

B. Inspection Procedures:
1. On receipt from contractor a written request for inspection with certification the project is substantially complete and a deficiency list, Architect will proceed with an inspection or advise Contractor of unfilled requirements.
   a. Architect shall prepare a deficiency list within seven calendar days.
2. Architect will prepare Certificate of Substantial Completion following inspection or advise Contractor of construction that must be completed or corrected before certificate can be issued.
   a. Architect will reinspect once when requested with assurance that punch list and Work is substantially complete.
   b. Results of completed inspection will form basis of requirements for Final Acceptance.
3. Owner will allow Contractor no longer than 30 calendar days from Date of Substantial Completion to remedy deficiencies.
3.02 FINAL ACCEPTANCE

A. Prior to requesting final inspection for certification of final acceptance and final payment, submit following:
   1. Final payment request with releases, including insurance certificates for products and systems where applicable.
   2. Updated final statement accounting for final additional changes to Contract Sum.
      a. Architect will prepare a final Change Order after final acceptance showing adjustments to Contract Sum which were not made previously by Change Orders.
   3. Certified copy of Architect's final inspection list of items to be completed or corrected, endorsed and dated by Architect.
      a. Certification to state each item has been completed or corrected or otherwise resolved for acceptance.
   4. Consent of Surety to Final Payment.
   5. Evidence of final, continuing insurance coverage complying with insurance requirements.

B. Reinspection Procedure:
   1. Architect will reinspect to verify status of completion upon receipt of notice that Work, including list of items from earlier inspection, has been completed.
      a. Indicate items for which completion is delayed under circumstances acceptable to Owner and Architect.
   2. If Work is found to be complete following final inspection, Architect will issue a certificate of final acceptance.
   3. Should Architect and Owner determine that Work is incomplete or defective:
      a. Architect will promptly notify Contractor, in writing, listing incomplete or defective Work.
      b. Contractor to remedy deficiencies promptly, and notify Architect when ready for reinspection.

3.03 PROJECT RECORD DOCUMENTS

A. Mark Drawings to show actual installation and construction where construction varies substantially from Work as shown.
   1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe change by graphic line and note.
   2. Date entries, and note related Change Order numbers where applicable.
   3. Call attention to entries by a "cloud" drawn around areas affected.
   4. Where overlapping changes occur, mark with different colors.

B. Conversion of schematic layouts:
   1. Design of future modifications of facility may require accurate information as to final physical layout of items which are shown schematically on Drawings.
   2. Show on Project set of Record Drawings, by dimension accurate to within one inch, centerline of each run of items shown schematically on Drawings. Clearly identify item by accurate note such as "cast iron drain", "galv. water", and like. Show, by
C. Ensure entries are complete and accurate, enabling future reference by Owner.

D. Store record documents separate from documents used for construction.

E. Record information concurrent with construction progress.

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. Field changes of dimension and detail.
   3. Details not on original Contract drawings.

G. Final Record Documents: Prior to request for Substantial Completion, secure from Architect at (1) One complete set of PDF copy of Contract Drawings.
   1. Carefully transfer change data shown on Project set of Record Drawings to corresponding PDF copy, coordinating changes as required.
   2. Clearly indicate at each affected detail and other drawings a full description of changes made during construction, and actual location of items.
   3. Show final location of electrical junction boxes and outlets, telephone and data outlets, supply and return registers, and like.
   4. Call attention to entries by a “cloud" drawn around areas affected.
   5. Make changes neatly, consistently, and with proper media to assure longevity and clear reproduction.

3.04 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.

3.05 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.


D. 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.

3.06 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. 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.

D. 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.

E. Provide servicing and lubrication schedule, and list of lubricants required.

F. Include manufacturer's printed operation and maintenance instructions.

G. Include sequence of operation by controls manufacturer.

H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

I. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

J. Additional Requirements: As specified in individual product specification sections.

3.07 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. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

F. 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.

G. 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.

H. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.

I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

J. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.

K. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
   3. Part 3: Project documents and certificates, including the following:
      a. Shop drawings and product data.

L. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.

M. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect, Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.
3.08 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner’s permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

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

E. Include originals of each in operation and maintenance manuals, indexed separately on Table of Contents.

END OF SECTION
SECTION 02 41 09
SELECTIVE STRUCTURE DEMOLITION

PART 1  GENERAL

1.01  SECTION INCLUDES
   A. Removal of designated building equipment and fixtures.
   B. Removal of designated construction.
   C. Products and installation for patching and extending Work.
   D. Disposal of materials.
   E. Repair of damaged surfaces, finishes, and cleaning.

1.02  REGULATORY REQUIREMENTS
   A. Conform to applicable code for demolition work, dust control, products requiring electrical disconnection and re-connection.
   B. Obtain required permits from authorities.
   C. Do not close or obstruct egress from any building exit or site exit.
   D. Do not disable or disrupt building fire or life safety systems without 3 days' prior written notice to Owner.
   E. Conform to applicable regulatory procedures when hazardous or contaminated materials are discovered.

1.03  FIELD CONDITIONS
   A. Conduct demolition to minimize interference with adjacent and occupied building areas.
   B. Cease operations immediately if structure appears to be in danger and notify Architect. Do not resume operations until directed.

PART 2  PRODUCTS

2.01  PRODUCTS FOR PATCHING AND EXTENDING WORK
   A. New Materials: As specified in product Sections; match existing Products and work for patching and extending work.
      1. Where new materials are indicated in Drawings and product Section for material is not included in Project Manual, provide new materials as specified in Drawings.
   B. Type and Quality of Existing Products: Determine by inspection and testing Products where necessary, referring to existing Work as a standard.

PART 3  EXECUTION

3.01  PREPARATION
   A. Provide, erect, and maintain temporary barriers at locations indicated.
B. Erect and maintain weatherproof closures for exterior openings.
C. Erect and maintain temporary partitions to prevent spread of dust, odors, and noise to permit continued building occupancy.
D. Protect existing materials that are not to be demolished.
E. Prevent movement of structure; provide bracing and shoring.
F. Notify affected utility companies before starting work and comply with their requirements.
G. Mark location and termination of utilities.

3.02 DEMOLITION
A. Disconnect, remove, and identify designated utilities within demolition areas.
B. Demolish in an orderly and careful manner. Protect existing supporting structural members.
C. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete.
   1. Replace materials as specified for finished Work.
D. Prepare surface and remove surface finishes to provide for proper installation of new work and finishes.
E. Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.
F. Remove materials as demolition progresses. Upon completion of demolition, leave areas in clean condition.
G. Remove temporary facilities.

3.03 INSTALLATION
A. Coordinate work of alterations and renovations to expedite completion sequentially and to accommodate Owner occupancy.
B. Project Finishes: Complete in all respects including operational mechanical and electrical work.
C. Remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to specified condition.
D. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.
E. In addition to specified replacement of equipment and fixtures restore existing plumbing, heating, ventilation, air conditioning, and electrical systems to full operational condition.
F. Install Products as specified in individual technical specification sections.
3.04 TRANSITIONS

A. Where new Work abuts or aligns with existing, perform a smooth and even transition.
   1. Patched Work to match existing adjacent Work in texture and appearance.

B. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.

3.05 ADJUSTMENTS

A. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.

B. Where a change of plane of 1/4 inch or more occurs, submit to Architect a recommendation for providing a smooth transition.

C. Trim existing doors as necessary to clear new floor finish.
   1. Refinish trim as required.

D. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.

E. Fit work at penetrations of surfaces as specified in Section 01 73 29 - Cutting and Patching.

3.06 FINISHES

A. Finish surfaces as specified in individual technical specification sections.

B. Finish patches to product uniform finish and texture over entire area.
   1. When finish cannot be matched, refinish entire surface to nearest intersections.

3.07 CLEANING

A. Clean Owner occupied areas affected by Work of this Project.

3.08 SCHEDULES

A. Remove, store and protect the following materials and equipment:
   1. Rooftop vent hoods as indicated on drawings.
   2. Mechanical control panels and associated dials, gauges and piping.

B. Protect the following materials and equipment to remain in place:
   1. Roof sheathing - See Section 01 22 00 Unit prices.
   2. Existing columns, slabs, beams and other structural elements.

END OF SECTION
SECTION 06 10 00
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Sheathing.
B. Roofing nailers.
C. Concealed wood blocking, nailers, and supports.

1.02 REFERENCE STANDARDS
C. ASTM C1513 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections; 2018.
G. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17; 2015.

1.03 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.04 QUALITY ASSURANCE
A. Lumber: Comply with PS 20 and approved grading rules and inspection agencies.
   1. Acceptable Lumber Inspection Agencies: WCLB and WWPA.
   2. Lumber of other species or grades, or graded by other agencies, is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

1.05 GRADE AND TREATMENT STAMPS
A. Identify each piece of framing lumber by grade stamp of West Coast Lumber Inspection Bureau, Western Wood Products Association.
B. Identify each wood sheathing panel as to species, grade, span rating and glue type by stamp of American Plywood Association.
C. Stamp each preservative treated lumber piece with AWPB grade stamp or furnish certificate of inspection with each shipment.

D. Identify each fire retardant treated wood piece, lumber and sheathing, with classification marking of UL, Timber Products Inspection, Inc., or other testing and inspecting agency acceptable to Architect and authorities having jurisdiction.

1.06 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. Do not overload, in place, floor or roof framing with temporarily stored materials.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Wood Structural Panels:
   1. Plywood: PS 1 With APA stamp.
      a. Thickness: As needed to comply with requirements specified but not less than thickness indicated.
      c. Factory mark panels according to indicated standard.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: West Coast Lumber Inspection Bureau; WCLIB (GR).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: Kiln-dry or MC15.

D. Stud Framing (2 by 2 through 2 by 6):
   2. Grade: No. 2.

E. Miscellaneous Framing, Backing, Nailers, Grounds:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.
   3. Size: 2 by 8 unless otherwise noted.
F. Roofing Nailer: PS 20 dimension lumber, Structural Grade No. 2 or better, Douglas Fir; or PS 1, APA Exterior Grade plywood; pressure preservative treated.
   1. Width: 3-1/2 inches (90 mm), nominal minimum, or as wide as the nailing flange of the roof accessory to be attached to it.
   2. Thickness: Same as thickness of roof insulation.

2.03 CONSTRUCTION PANELS

A. Plywood Roof Sheathing: APA Rated Sheathing, Exterior Exposure Class, as indicated on drawings and as follows:
   1. Grade: C-D.
   2. Thickness: As indicated on drawings.
   3. Oriented-strand-board not permitted.
   4. Provide tongue and groove edges.

2.04 ACCESSORIES

A. Fasteners and Anchors:
   1. Provide fasteners of size and type indicated that comply with requirements specified for material and manufacture.
      a. Size: Thickness and of sufficient length to penetrate studs a minimum 3/4 inch.

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. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Preservative Treatment:
   1. Preservative Pressure Treatment of Lumber Above Grade: AWPA Use Category UC3B, Commodity Specification A (Treatment C2) using SBX.
      a. Borate Preservative Treatment: Disodium octoborate tetrahydrate (DOT) treatment for insect and decay protective pressure treatment of wood as produced by manufacturer’s licensed treatment plants.
      b. Kiln dry lumber after treatment to maximum moisture content of 15 percent.
      c. Treat interior lumber inside the weather barrier membrane.
      d. Treat lumber in contact with roofing, flashing, or waterproofing.
         1) Including wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members.
e. Treat lumber in contact with masonry or concrete.
f. Treat lumber furring.

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. Install material in accordance with manufacturers instructions.

B. Select material sizes to minimize waste.

C. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

D. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

E. Framing shall be dry with 19 percent maximum moisture content at time of covering.

3.03 BACKING, NAILERS, AND SUPPORTS

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

B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.
   1. Install fire stop blocking in wood framed walls and partitions at each floor level and at ceiling line of top story.
   2. Install smoke stop blocking at combustible blind spaces exceeding 10 feet in any dimension, to create a barrier to passage of flame at 10 feet maximum intervals. Do same at furred spaces and utility chases.
   3. Install smoke stop blocking at double stud wood-framed walls and partitions at maximum intervals of 10 feet in any dimension.
   4. Install smoke stop blocking along and in line with run of each stairway in adjacent wood stud walls and partitions.

C. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

D. Bridging:
1. Install wood cross bridging, not less than 2 x 3 inch nominal, 16 gauge steel cross bridging of equal strength, or solid blocking between joists where span of joists exceeds 8 feet.
2. Install bridging at a maximum distance of 8 feet between a line of bridging and a joist bearing.
3. Do not anchor cross bridging until dead loads are in place. Space cross bridging members 1/4 inch minimum apart to avoid rubbing.

3.04 ROOF-RELATED CARPENTRY
A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.
B. Provide pressure treated wood curb at roof openings except where prefabricated curbs are specified and where specifically indicated otherwise. Form corners by alternating lapping side members.
   1. Shim curb to make level.

3.05 INSTALLATION OF CONSTRUCTION PANELS
   1. Space panels 1/8 inch apart at edges and 1/16 inch at ends.
B. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing or as indicated on structural drawings.
   1. Provide solid edge blocking between sheets or as indicated on structural drawings.
   2. Nail panels to framing; staples are not permitted.
C. Fastening Methods: Fasten panels as indicated below:
   1. Roof Sheathing:
      a. Provide minimum size, spacing and location per Building Code.
      b. Refer to Structural drawings for special nailing requirements.
      c. Nail to wood framing.
      d. Space panels 1/8 inch apart at edges and ends.

3.06 SITE APPLIED WOOD TREATMENT
A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer’s instructions.
B. Allow preservative to dry prior to erecting members.

3.07 FIELD QUALITY CONTROL
A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.
B. Tests of wood framing moisture content may be performed at any time and before finish cover to ensure conformance with specified requirements.
   1. Wood framing to be dry with 19 percent maximum moisture content.
3.08 **CLEANING**

A. Waste Disposal: Comply with the requirements of Section 01 74 19 - 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.
   4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

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 07 01 50.19
PREPARATION FOR RE-ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Replacement of existing roofing system in preparation for entire new roofing system.
B. Removal of existing flashing and counterflashings.
C. Temporary roofing protection.

1.02 RELATED REQUIREMENTS
A. Section ____ - ____: Roof system.

1.03 PRICE AND PAYMENT PROCEDURES
A. See Section 01 22 00 - Unit Prices, for additional unit price requirements.
   1. Repair Existing Roof Wood Decking:
      a. Basis of Measurement: By the square foot.
      b. Basis of Payment: Includes replacing decking with new material of same thickness.

1.04 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. Attendees:
      a. Architect.
      b. Contractor.
      c. Owner.
      d. Installer.
      e. Roofing system manufacturer's field representative.
   2. Meeting Agenda: Provide agenda to participants prior to meeting in preparation for discussions on the following:
      a. Removal and installation schedule.
      b. Necessary preparatory work.
      c. Protection before, during, and after roofing system installation.
      d. Removal of existing roofing system.
      e. Installation of new roofing system.
      f. Temporary roofing and daily terminations.
      g. Transitions and connection to and with other work.
      h. Inspections and testing of installed systems.

1.05 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Submit for each type of material.

1.06 QUALITY ASSURANCE

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

1.07 DELIVERY, STORAGE, AND HANDLING

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

1.08 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. Provide notice at least three days before starting activities that will affect normal building operations.

D. Verify that occupants have been evacuated from building areas when work on structurally impaired roof decking is scheduled to begin.

E. Owner will occupy building areas directly below re-roofing area.
   1. Provide Owner with at least 48 hours written notice of roofing activities that may affect their operations and to allow them to prepare for upcoming activities as necessary.

PART 2 PRODUCTS

2.01 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 EXAMINATION

A. Verify that existing roof surface has been cleared of materials being removed from existing roofing system and ready for next phase of work as required.

3.02 PREPARATION

A. Sweep roof surface clean of loose matter.

B. Remove loose refuse and dispose of properly off-site.
3.03 MATERIAL REMOVAL
   A. Remove only existing roofing materials that can be replaced with new materials the same day.
   B. Remove metal counter flashings.
   C. Remove damaged portions of roofing membrane, perimeter base flashings, flashings around roof protrusions, insulation vents.
   D. Remove damaged insulation and fasteners, cant strips, blocking.
   E. Repair existing wood deck surface to provide smooth working surface for new roof system.

3.04 INSTALLATION
   A. Coordinate scope of this work with requirements for installation of new roofing system, refer to Section 07 54 13 for additional requirements.

3.05 PROTECTION

END OF SECTION
SECTION 07 25 11

SELF-ADHERED MEMBRANE FLASHINGS (SAM-FLASHING)

PART 1  GENERAL

1.01  SECTION INCLUDES

A.  Self-adhered membrane flashing, strips. (SAM FLASHING)
B.  Foil faced self-adhered membrane flashing, strips. (SAM FLASHING - FF)
C.  High temperature self-adhered membrane flashing, strips. SAM FLASHING - HT)
D.  Through-wall self-adhered membrane flashing, strips. (SAM FLASHING - TW)
E.  Accessories

1.02  REFERENCE STANDARDS


1.03  ADMINISTRATIVE REQUIREMENTS

A.  See Section 01 30 00 - Administrative Requirements, for pre-installation meeting procedures.
B.  Preinstallation Meeting: Conduct a preinstallation meeting at least one week prior to the start of the work of this section; require attendance by all affected installers.

1.04  SUBMITTALS

A.  See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B.  Product Data:
   1.  Manufacturer's specifications and other data needed to show compliance with specified requirements.
2. Tested physical and performance properties of waterproofing, including compliance with limits on VOC emissions.
3. Manufacturer's installation instructions.
4. Product data sheets for products supplied under this Section including primers and accessory detailing compounds.

C. Shop Drawings:
   1. Show locations and extent of membranes and membrane flashings.
   2. Include details at penetrations, and termination conditions including at adjoining construction.

D. Test Reports:
   1. Product test reports from an independent Testing Agency.

E. Certifications:
   1. Installer certificate signed by manufacturer certifying installer has been trained and approved by manufacturer to install specified product.
   2. Manufacturers Certificates indicating adhesive and chemical compatibility with adjacent and accessory products specified herein or in other Sections including but not limited to Sheathing, Pedestrian Traffic Coatings, and Joint Sealers.

1.05 QUALITY ASSURANCE

A. Installer:
   1. Engage an applicator currently approved in writing by membrane manufacturer.
   2. Membrane Manufacturer Qualifications: Company specializing in waterproofing self-adhered membranes with ten years experience.
   3. Installer Qualifications: Company specializing in performing work of this Section with minimum five years experience and who has successfully completed a minimum of 3 projects of similar size, quality and complexity.
      a. Installer to be currently approved in writing by membrane manufacturer.
   4. Coordinate as required with other trades interfacing with Work of this Section to ensure proper and adequate provision for preceding or sequential Work.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to jobsite in manufacturer's original packaging, with labels intact and legible.

B. Storage:
   1. Maintain packaging, seals and labels intact until time of use.
   2. Store materials off ground and protected from damage, including that resulting from exposure to direct sunlight.
   3. Store roll materials on end.

1.07 FIELD CONDITIONS

A. Do not install primer or membrane when temperature is below 41 degrees F.
   1. Use cold weather products when application is between 25 and 41 degrees F per manufacturer's written instructions.
2. Do not install product below 25 degrees F.

B. Do not install membrane in standing water, during wet or damp weather, or on wet, damp or frost covered substrates.

1.08 WARRANTY

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

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

C. Special Manufacturer's Warranty:
   1. Written warranty, signed by membrane manufacturer, agreeing to replace membrane material that does not comply with requirements or that does not remain water, air and vapor tight during specified warranty period.
   2. Warranty does not include failure of membrane due to failure of substrate prepared and treated according to requirements or formation of new joints and cracks in substrate exceeding 1/16 inch in width.

D. Special Installer's Warranty: Written membrane Installer's warranty, signed by Installer, covering Work of this Section, for warranty period of two (2) years.

PART 2 PRODUCTS

2.01 SYSTEM DESCRIPTION

A. Self-adhered membrane flashing to make exterior walls and joints between exterior walls water vapor-resistant and air-tight.
   1. Membrane to prevent passage of water, air infiltration, vapor diffusion and complies with requirements as demonstrated by mock-up testing by independent Testing Agency of manufacturer's membrane.

B. Environmental Characteristics:
   1. Comply with State VOC requirements or no VOC content, no formaldehyde content, are water-based rather than solvent-based, and are certified to not off-gas.

2.02 MATERIALS

A. Self-Adhered Membrane Flashing (SAM FLASHING):
   1. Self-adhered membrane over exterior wall cavity sheathing opening penetrations and as indicated:
   2. General:
      a. HDPE faced, asphalt-butyl hybrid, self-adhesive membrane.
      b. Thickness: 40 mils, excludes removable release film protecting adhesive surface.
      c. Tested and shown to resist softening, flow, or deterioration of temperatures between 14 and 150 deg F.

b. Tremco Product ExoAir 110AT; www.tremcosealants.com

c. Substitutions: See Section 01 60 00 - Product Requirements.

B. Foil-faced Self-Adhered Membrane (SAM FLASHING - FF):
1. Use where sealant required to adhere to membrane.
2. General:
   a. Aluminum foil-faced, butyl based rubberized, self-adhesive membrane.
   c. Tested and shown to resist softening, flow, or deterioration at temperatures up to 300 deg F.
   d. Apply single-component neutral-cure sealant 795 by Dow Corning at membrane terminations and where indicated.
3. Products:
   b. Tremco; Product: ExoAir 111AT; www.tremcosealants.com
   d. Substitutions: See Section 01 60 00 - Product Requirements.

C. High-temperature Self-Adhered Membrane Flashing (SAM FLASHING - HT):
1. Provide membrane flashing where sealant to membrane not required, under sheet metal flashings and copings, metal roofing and siding including mechanical penthouse siding and roof and as indicated:
2. General:
   b. Thickness: 45 mils minimum, excludes removable release film protecting adhesive surface.
   c. Tested and shown to resist softening, flow, or deterioration at temperatures up to 300 deg F.
3. Products:
   b. Tremco: ExoAir 110AT; www.tremcosealants.com
   d. Substitutions: See Section 01 60 00 - Product Requirements.

D. Through-Wall Self-Adhered Membrane Flashing (SAM FLASHING - TW):
1. Cross-laminated high-density polyethylene (HDPE) film laminated to an aluminum foil facing, conforming to the following:
   a. Minimum thickness: 45 mils.
   c. Tensile strength: 400 psi when tested in accordance with ASTM D412.
   d. Peel strength: 40 psi when tested in accordance with ASTM D903.
e. Elongation: Minimum of 225% when tested in accordance with ASTM D412.
g. Vapor permeance: <.05 when tested in accordance with ASTM E96/E96M.

2. Manufacturer:
   b. Substitutions: See Section 01 60 00 - Product Requirements.

E. Elastic Self-Adhered Membrane Flashing (SAM FLASHING - EL):
   1. Elastic self-adhering flashing tape conforming to the following:
      a. Minimum thickness w/out liner: 38 mils.
      c. Tensile strength at break: 4.2 PSI when tested in accordance with ASTM D412.
      d. Elongation at break: ≥ 300% when tested in accordance with ASTM D412.
      e. Nail Sealability: Passes ASTM E331.
      f. UV Exposure limit: 12 months.
   2. Manufacturer:
      a. Basis of Design: 3M Company; Product - Ultra Conformable Flashing Tape 3015 UC.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

F. Preformed Penetration Flashing:
   1. System Description:
      a. Flashing panels to weatherproof building penetrations, plumbing and electrical penetrations in exterior walls.
   2. Products: Types as to fit application.
      a. Mechanical and Plumbing Flashing Panels:
         1) Materials: Combination of high-density polyethylene (HDPE) and low-density polyethylene (LDPE).
      b. Electrical Flashing Panels:
         1) Material: Thermoplastic elastomer.
   3. Manufacturer:
      b. Substitutions: See Section 01 60 00 - Product Requirements.

G. Accessories:
   1. Surface Conditioners/Primers: High-tack SBS rubber based primer or as recommended by manufacturer.
   2. Fasteners: Stainless steel.
   3. Detailing Compounds: Liquid membrane, 1 or 2 component sealants or mastics supplied by membrane manufacturer intended for detailing around penetrations and at lapped seams.

2.03 SEALANTS

A. Silicone Sealant: As specified in Section 07 92 00.
B. Sealant Backers: As specified in Section 07 92 00.

C. Primers, Cleaners, and Other Sealant Materials: As recommended by sealant manufacturer, appropriate to application, and compatible with adjacent materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Applicator to examine areas and conditions under which Work of this Section will be performed.

1. Verify conformance with Manufacturers requirements.
2. Report unsatisfactory conditions in writing to Architect.
3. Do not proceed until unsatisfactory conditions are corrected.
   a. Coordinate with other trades to assure proper and adequate interface with Work of this Section.
   b. Verify items that penetrate sheathing surfaces are securely installed prior to membrane application.

3.02 PREPARATION

A. Protect adjacent surfaces not designated to receive membrane.

B. Do not apply membrane to surfaces unacceptable to manufacturer or applicator.

C. Surface Conditioner/Primer:

1. Apply surface condition/primer to substrates and at rate recommended by manufacturer such that substrate is uniformly coated.
2. Conditioner not be to applied so thick that it will run or puddle.
3. Mask and protect adjoining exposed finish surfaces to protect from excessive application of surface conditioner.
4. Allow surface conditioner to dry completely prior to installation of membrane.
5. Cure time will vary with weather conditions.
   a. Do not apply surface conditioner to areas which will not be covered with membrane in same day.
   b. Recoad areas not covered with membrane after twelve (12) hours or if contaminated by dust.

D. Detailing:

1. Apply bed of detailing compound at perimeter conditions.
2. Apply bed of detailing compound around penetrations, wall jacks.
3. Install detail strips of membrane as indicated in Drawings or at opening penetrations or material transitions.
4. Utilize hand roller to ensure full contact adhesion of membrane materials.
5. Install flashings and sealants at opening penetrations as indicated in Drawings or as required by manufacturer.
6. Apply sill drainage mesh under sill at flanged windows, cut to window width. Secure with sealant or staples.
3.03 INSTALLATION

A. Install system per manufacturer’s written installation instructions, except where more rigorous requirements are contained herein.
   1. Roll out membrane. Discard wrinkled or bubbled material.
   2. Sequence membranes to allow tie-in to openings and transitions.

B. Lap each sheet or strip in watershedding manner with upper sheets over lapping lower sheets in horizontal fashion.

C. Sheets and strips to be rolled with hand roller to ensure complete and even adhesion. Air pockets, fishmouths or unadhered areas of membrane to be cut out and repaired.
   1. Provide 3 inch wide strips at furring.
   2. Provide 4 x 4 inch diamond patch at masonry ties.

D. Laps: Minimum of 2 inches, unless otherwise noted.
   1. Wipe down scrim material at each overlap area using two rag alcohol wipe method to remove dust or contaminants prior to installing successive sheets or strips.
   2. Roll each lap with hand roller to ensure full and complete adhesion.
   3. Detail each exposed edge with detailing compound within one day of installation.

E. Detail around clips and metal ties. Set clips and metal ties in full bed of detailing compound or 4 x 4 inch SAM patch.
   1. Membrane not to be exposed to ultraviolet light (sunlight) for longer than 30 days or as established in manufacturer’s written literature, whichever is more stringent.

3.04 REPAIR

A. Where damaged, a repair patch of like membrane may be installed.
   1. Cut out damage membrane, clean scrim surface around patch area with a two rag alcohol wipe, and apply a patch of material extending six inches around edge of damaged area.
   2. Roll seams tight with a hand roller and detail edges with detailing compound.
   3. Seal leading edge of patch with mastic.

3.05 PROTECTION

A. Protect membrane from damage and wear during construction period.

B. Protect membrane from welding activities during construction period.

3.06 CLEANING

A. Clean spillage and soiling from adjacent construction. Remove from jobsite refuse and debris and dispose of per Section 01 74 19.

END OF SECTION
SECTION 07 54 13
THERMOPLASTIC MEMBRANE ROOFING (TPO)

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Induction Welded Mechanically Fastened membrane roofing system.
B. Roof insulation over wood substrate.
C. Protection board.
D. Roof Vapor Retarder
E. Roof Edging, Fascias and Copings.
F. Walkway pads.

1.02 REFERENCE STANDARDS
M. FM DS 1-29 - Roof Deck Securement and Above-Deck Roof Components; Factory Mutual System; 2016.
1.03 ADMINISTRATIVE REQUIREMENTS

A. See Section 01 30 00 - Administrative Requirements, for pre-installation meeting procedures.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

1. Agenda:
   a. Review in detail Architect’s Specifications, roof plans and roof and flashing details.
   b. Review Factory Mutual and/or Underwriters Laboratories requirements, and resolve conflicts.
   c. Review required submittals both completed and yet to be completed.
   d. Review Drawings for location of differing membrane applications, roof slope, deck type, drainage, membrane attachment, expansion joints, flashing, details, and like.
      1) Resolve any conflicts between what is considered good roofing practice and Specifications.
   e. Review proposed roofing system and recommended work practices for its installation.
   f. Determine whether different roof areas have different requirements.
   g. Review required inspection, testing, certifying and material usage accounting procedures.
   h. Review structural loading limitations of deck and inspect deck for loss of flatness and for required attachment.
      1) Designate which areas on site to be available for use as storage area and working area.
   i. Review procedures to be followed to provide proper protection of roof system during and after construction of roof.
   j. Review and finalize construction schedule related to roofing work and verify availability of materials, Installer’s personnel, equipment and facilities needed to make progress and avoid delays.
   k. Review notification procedures for weather or non-working days.
   l. Record discussion of conference including decisions and agreements reached and furnish copy of record to each party attending. If substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.

C. Scheduling:

1. Sequence installation of roofing with related units of work specified in other sections to ensure that roof assemblies including roof accessories, flashing, trim
and joint sealers are protected against damage from effects of weather, corrosion and adjacent construction activity.

1.04 SUBMITTALS

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

B. Shop Drawings: Membrane sheet layout, accessories, flashing and termination details.

C. Product Data:
   1. Product data sheets for each material required, including:
      a. Membrane.
      b. Membrane fasteners.
      c. Insulation.
      d. Insulation fasteners.
      e. Metal accessories.
      f. Calks and sealants.
      g. Unreinforced flashing material.
      h. Preformed corners and boots.
      i. Other required materials.
   2. Manufacturer's standard details for each applicable project condition.

D. Assembly Data: Provide Stamped engineered calculations licensed in the State the project is located, indicating roof assembly meets higher of either, Building Code or Owner's building insurance required values for wind uplift.

E. Shop Drawings: Submit roof drawing indicating details to be employed in project. Include:
   1. Outline and size of roof.
   3. Location and type of penetrations.
   4. Perimeter and penetration flashing detail references.
   5. Complete drawings of non-manufacturer-standard details to be used, with details of construction.
   6. Indicate elevation changes in parapet walls, fire walls, adjacent roof areas, and similar roof geometry.
   7. Indicate joint or termination detail conditions, conditions of interface with other materials, setting plan for tapered insulation, mechanical fastener layout, and walkway pad layout.

F. Manufacturer's Written Installation Instructions: Indicate membrane seaming precautions, special procedures, and perimeter conditions requiring special attention.

G. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
   1. Manufacturer's written approval of this specification and of any proposed deviations from specification or drawings or previously approved details.
   2. Manufacturer's approval does not constitute a waiver of requirements of this specification or drawings or approval of deviations not specifically itemized.
   3. Do not proceed with such deviation without written approval of Architect.

Project Number 195390
H. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.

I. Pre-Installation Notice: Copy to show that manufacturer's required Pre Installation Notice (PIN) has been accepted and approved by the manufacturer.

J. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
   1. Completed request for warranty, by manufacturer-authorized installer, including following items.
      a. Samples and data sheets of materials not supplied or approved by manufacturer.
      b. Type and thickness of insulation.
      c. Shop drawings specified above.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with NRCA (RM) and manufacturer's instructions.

B. Roofing system warranty provided by Membrane Manufacturer.

C. Manufacturer required to produce and supply membrane and accessories.

D. Applicator Qualifications: Company specializing in performing work of this section with minimum five years experience.
   1. Use an applicator currently approved in writing by Manufacturer of roofing system.
   2. Use skilled workers trained and experienced in crafts and familiar with requirements and methods needed for proper performance of Work.

E. Membrane manufacturer technical representative to make site inspections, before, during, and after installation of Work.
   1. Inspections to be performed and documented by designated and properly qualified technical representative of membrane manufacturer.
   2. Verify that materials and Work meet specified requirements.
   3. Should Work and/or materials not meet specified requirements, promptly advise Architect with recommended course of action.

1.06 PROJECT CONDITIONS

A. Coordinate work with installation of associated counterflashings installed by other sections as work of this section proceeds.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Storage of Materials:
   1. Deliver insulation to job site in its manufacturer's original container, with labels intact and legible.
   2. Maintain packaging, seals and labels intact until time of use.
   3. Store roofing materials, including insulation, in a dry place, on raised platforms, and cover with waterproof tarpaulins, protected from sun and weather.
   4. Store solvents, sealants, and adhesives in a cool, dry area.
5. Keep lids tightly sealed on sealants, solvents and adhesives.
6. Do not overload roof structure by concentrating stored materials in certain locations.
7. Store adhesives at temperature above 40 degrees F.

1.08 FIELD CONDITIONS

A. Do not apply roofing membrane or insulation during inclement weather or when ambient temperatures are below 50 degrees F, unless conditions are as recommended by Manufacturers printed instructions.

B. Do not apply roofing membrane to damp or frozen deck surface; do not begin work until surfaces are sufficiently dry to receive new work.

C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be rendered watertight during same day.

D. Refrain from roofing operations when wind velocity is sufficiently high to lift roofing membrane sheets and pose a danger to workers.

1.09 MANUFACTURER’S INSPECTIONS

A. Roofing System Manufacturer to provide following:
   1. Keep Architect informed as to progress and quality of work as observed.
   2. Provide job site inspections a minimum of three days a week.
   3. Report to Architect in writing any failure or refusal of Contractor to correct unacceptable practices called to Contractor’s attention.
   4. Confirm after completion of project and based on manufacturer’s observation and tests that manufacturer has observed no applications procedures in conflict with specifications other than those that may have been previously reported and corrected.

1.10 WARRANTY

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

B. Manufacturer:
   1. Total system and no dollar limit to include membrane, insulation and flashing covering Twenty (20) years: Defective materials, installation and watertight integrity of roofing system.
      a. No exclusions for ponded water.

C. Installer: 2 years defective materials and installation, including any resulting damage to building materials and/or building contents.

PART 2 PRODUCTS

2.01 MANUFACTURER


2.02 PERFORMANCE REQUIREMENTS

A. Installed roofing membrane and base flashings to remain watertight, resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

B. UL (FRD), Class A for Roofing System.

C. Wind resistance to meet:
   2. Wind Design Criteria: 100 mph, Exposure B.

2.03 MATERIALS

A. Membrane: Flexible, heat weldable sheet composed of thermoplastic polyolefin polymer and ethylene propylene rubber; complying with ASTM D6878/D6878M with polyester weft inserted reinforcement and and bearing UL label on packaging.
   1. Sheet Width: 120 inches minimum.
   2. Thickness: 0.060, nominal, when measured in accordance with ASTM D751 with coating thickness over reinforcement of 0.024 inch.
   4. Solar Reflectance: 0.34, minimum when tested in accordance with ASTM C 1549
   5. Puncture Resistance: 265 lbf (1174 N), minimum, when tested in accordance FTM 101C Method 2031.
   6. Breaking Strength: 390 lbf, when tested in accordance with ASTM D751, Grab Method.
   7. Tear strength (ASTM D751, Procedure B), 8 x 8 inch sample: 120 lbf
   9. Water absorption (ASTM D471) 158 degrees F for 7 days: Plus 2.0 percent maximum weight change
   10. Ozone resistance of unreinforced membrane: No cracking when tested in accordance with ASTM D1149, for 70 hr at 100 degrees F.

B. Membrane Fasteners and Plates: Specially engineered and manufactured for the induction welding process. Type and size as required by roof membrane manufacturer for roofing system and warranty to be provided; use only fasteners and plates furnished by roof membrane manufacturer.

C. Curb and Parapet Flashing: Same material as membrane, with encapsulated edge which eliminates need for seam sealing the flashing-to-roof splice; precut to 18 inches (457 mm) wide.

D. Formable Flashing: Non-reinforced, flexible, heat weldable sheet, composed of thermoplastic polyolefin polymer and ethylene propylene rubber.
   1. Thickness: 0.060 inch (1.52 mm) plus/minus 10 percent.
   2. Tensile Strength: 1550 psi (10.7 MPa), minimum, when tested in accordance with ASTM D 638 after heat aging.
3. Elongation at Break: 650 percent, minimum, when tested in accordance with ASTM D 638 after heat aging.
4. Tearing Strength: 12 lbf (53 N), minimum, when tested in accordance with ASTM D 1004 after heat aging.
5. Color: Same as field membrane.
6. Product:
   a. Firestone ULTRAPLY TPO Flashing.

E. Tape Flashing: 5-1/2 inch (140 mm) nominal wide TPO membrane laminated to cured rubber polymer seaming tape, overall thickness 0.065 inch (1.6 mm) nominal; TPO QuickSeam Flashing by Firestone.

F. Pourable Sealer: Two-part polyurethane, two-color for reliable mixing; Pourable Sealer by Firestone.

G. Termination Bars: Aluminum bars with integral caulk ledge; 1.3 inches (33 mm) wide by 0.10 inch (2.5 mm) thick; Firestone Termination Bar by Firestone unless otherwise noted.

H. Cut Edge Sealant: Synthetic rubber-based, for use where membrane reinforcement is exposed; UltraPly TPO Cut Edge Sealant by Firestone.

I. Primer:
   1. Product: Firestone SA Water Based Primer (W563587091)

J. TPO - Vapor Retarder: vapor barrier comprised of SBS modified bitumen adhesive, factory-laminated to a tri-laminate woven, high-density polyethylene top surface with a polymeric release liner protecting the adhesive.
   1. Thickness: 30 mils in accordance with ASTM D5147/D5147M.
   2. Water Vapor Permeance:
      a. ASTM E 96 Procedure B: 0.03 perms.
   3. Air Permeability: ASTM E2178 <0.0002 ft³/min•ft² (<0.0011 L/sec•m²).
   4. Manufacturers:

K. Coated Sheet Metal: Flexible non-reinforced thermoplastic polyolefin membrane factory laminated to hot dipped galvanized steel, G-90.
   1. Type: Manufacturer's standard
   2. Gauge: 24

L. Molded Flashing: Same membrane as specified above.
   1. Vent stacks, pipes, drains, and corners: Prefabricated pipe boots and inside and outside corners provided by manufacturer.
   2. Field-fabricated flashing for vent stacks, pipes, drains, and corners: 0.055 inch thick, ethylene-propylene-based membrane.
   3. Exception: Perimeter gravel stops and drip edges, use manufacturer provided coated metal.

M. Roof Walkways: Non-reinforced TPO walkway pads, 0.130 inch (3 mm) by 30 inches (760 mm) by 40 feet (12.19 m) long with patterned traffic bearing surface.
1. UltraPly TPO Walkway Pads by Firestone.

N. Sealants:
1. EPDM-based, one part, white general purpose sealant; UltraPly TPO General Purpose Sealant by Firestone.

O. Cover Board: High Density Polyisocyanurate, Non-combustible, water resistant high density, closed cell polyisocyanurate core with coated glass mat facers, complying with ASTM D 1623.
1. Size: 48 inches (1220 mm) by 96 inches (2440 mm), nominal.
   a. Exception: Board to be attached using adhesive or asphalt may be no larger than 48 inches (1220 mm) by 48 inches (1220 mm), nominal.
2. Thickness: 0.5 inch (12.7mm).
3. R-Value: 2.5 R based on ASTM tests C158 and C177.
4. Surface Water Absorption: <3%, maximum, when tested in accordance with ASTM C 209.
5. Compressive Strength: 120psi, when tested in accordance with ASTM 1621.
6. Density: 5pcf, when tested in accordance with ASTM 1622.
7. Factory Mutual approved for use with FM 1-60 and 1-90 rated roofing assemblies.
8. Mold Growth Resistance: Passed, when tested in accordance with ASTM D 3273.
9. Attachment: Mechanical through fastening.
10. Product:
   a. Firestone ISOgard HD Cover Board.

P. Polyisocyanurate Board Insulation: Closed cell polyisocyanurate foam with black glass reinforced mat laminated to faces, complying with ASTM C 1289 Type II Class 1, with the following additional characteristics:
1. Thickness: As indicated on drawings.
2. Size: 48 inches (1220 mm) by 96 inches (2440 mm), nominal.
   a. Exception: Board to be attached using adhesive or asphalt may be no larger than 48 inches (1220 mm) by 48 inches (1220 mm), nominal.
3. R-Value (LTTR): 1.0 inch (25 mm) Thickness: 5.7 R, minimum.
4. Compressive Strength: 20 psi (138 kPa) when tested in accordance with ASTM C 1289.
5. Ozone Depletion Potential: Zero; made without CFC or HCFC blowing agents.
   a. Attachment: Mechanical through fastening.
7. Top Layer: Polyisocyanurate foam board, non-composite.
   a. Attachment: Mechanical through fastening.
8. Product:
   a. Firestone ISO 95+ polyiso board insulation.

Q. Insulation Fasteners: Specially engineered and manufactured for the induction welding process. Type and size as required by roof membrane manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane manufacturer.
R. Metal Roof Edging and Fascia: Continuous metal edge member serving as termination of roof membrane and retainer for metal fascia; watertight with no exposed fasteners; mounted to roof edge nailer.
   1. Wind Performance:
      a. Membrane Pull-Off Resistance: 100 lbs/ft (1460 N/m), minimum, when tested in accordance with ANSI/SPRI ES-1 Test Method RE-1, current edition.
      c. Provide product listed in current Factory Mutual Research Corporation Approval Guide with at least FM 1-270 rating.
   2. Description: Two-piece; 45 degree sloped galvanized steel sheet edge member securing top and bottom edges of formed metal fascia:
      a. Product: Firestone EdgeGard or approved.
   3. Fascia Face Height: 5 inches.
   4. Edge Member Height Above Nailer: 1-1/4 inches.
   5. Length: 144 inches.
   6. Functional Characteristics: Fascia retainer supports while allowing for free thermal cycling of fascia.
   7. Aluminum Bar: Continuous 6063-T6 alloy aluminum extrusion with pre-punched slotted holes; miters welded; injection molded EPDM splices to allow thermal expansion.
   8. Anchor Bar Cleat: 20 gage, 0.036 inch (0.9 mm) G90 coated commercial type galvanized steel with pre-punched holes.
  10. Fasteners: Factory-provided corrosion resistant fasteners, with drivers; no exposed fasteners permitted.
  11. Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, scuppers, and end caps; minimum 14 inch (355 mm) long legs on corner pieces.
  12. Accessories: Provide matching wall cap, downspout, extenders, and other special fabrications as shown on the drawings.

S. Parapet Copings: Formed metal coping with galvanized steel anchor/support cleats for capping any parapet wall; watertight, maintenance free, without exposed fasteners; butt type joints with concealed splice plates; mechanically fastened as indicated.

1. Wind Performance:
   a. At least the minimum required when tested in accordance with ANSI/SPRI ES-1 Test Method RE-3, current edition.
   b. Provide product listed in current Factory Mutual Research Corporation Approval Guide with at least FM 1-90 rating.

2. Description: Coping sections allowed to expand and contract freely while locked in place on anchor cleats by mechanical pressure from hardened stainless steel springs factory attached to anchor cleats; 8 inch (200 mm) wide splice plates with factory applied dual non-curing sealant strips capable of providing watertight seal.
3. Material and Finish: 24 gage, 0.024 inch (0.06 mm) thick galvanized steel with Kynar 500 finish in manufacturer's standard color; matching concealed joint splice plates; factory-installed protective plastic film.

4. Dimensions:
   a. Wall Width: As indicated on the drawings.
   b. Piece Length: Minimum 144 inches (3650 mm).
   c. Curved Application: Factory fabricated in true radius.

5. Anchor/Support Cleats: 20 gage, 0.036 inch (0.9 mm) thick prepunched galvanized cleat with 12 inch (305 mm) wide stainless steel spring mechanically locked to cleat at 72 inches (1820 mm) on center.

6. Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, corners, intersections, curves, pier caps, and end caps; minimum 14 inch (355 mm) long legs on corner, intersection, and end pieces.

7. Fasteners: Factory-furnished; electrolytically compatible; minimum pull out resistance of 240 pounds (109 kg) for actual substrate used; no exposed fasteners.

T. Roof Nailers: See Section 06 10 00 Rough Carpentry.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions under which work of this Section will be performed.
   1. Correct conditions detrimental to timely and proper completion of Work.
   2. Do not proceed until unsatisfactory conditions are corrected.

B. Verification of Conditions:
   1. Layout: Verify layout of work before beginning installation.
   2. Existing conditions: Examine substrate before beginning installation.
      a. Examine surfaces for inadequate anchorage, drainage, foreign material, moisture and unevenness which would prevent execution and quality for application of roofing system as specified.
   3. Verify work of other trades which penetrates roof deck has been completed.
   4. Verify that positive roof slope exists in areas.
   5. Verify that rooftop mechanical units are to have their condensation lines piped to drains or off roof surface.
   6. Block off or shut down positive pressure building ventilation systems during application to prevent sheet from billowing during application.

3.02 COORDINATION

A. Coordinate Work of this Section with Work of other Sections.
   1. Verify placement of drain pan linings, and like; coordinate roof penetrations, equipment bases and other conditions as required.
   2. Reset roof drains or scuppers that are not at proper level to drain finished roof before proceeding.
B. Do not start work until Pre-Installation Notice has been submitted to manufacturer as notification that this project requires a manufacturer's warranty.

3.03 PROTECTION OF PROPERTY
A. Protect finished surfaces of building from damage by installation of roofing system.
   1. Protect completed roofing and flashings from damage by subsequent roofing installation and construction traffic.

B. Protective Coverings:
   1. Lap protective coverings at least 6 inches, secure against wind, and vent to prevent collection of moisture on covered surfaces.
   2. Keep protective coverings in place for duration of roofing work.
   3. Damaged Work and Materials: Restore work and materials damaged during installation to original condition or replace with new materials.

3.04 FASTENERS - GENERAL
A. Install fasteners with a depth-sensing screw gun to prevent overdriving or underdriving, unless otherwise approved or required by project conditions.

3.05 INSTALLATION
A. Install Work of this Section in accordance with:
   1. Construction documents
   2. Reviewed shop drawings
   3. Procedures, as required by roofing materials manufacturers written installation instructions, regulations of governmental agencies having jurisdiction, Specifications, and as agreed to in pre-roofing meeting.

B. Surface: Dry and broom clean before beginning work, completely free of ice or frost and free of sharp edges, fins, roughened surfaces, loose or foreign materials, oil, grease and other materials that may damage the membrane..

3.06 VAPOR RETARDER INSTALLATION
A. Membrane can be applied at ambient temperatures as low as 25 °F (-4 °C) if it has been stored in a heated area so that it will be between 50 °F (10 °C) and 100 °F (38 °C) at the time of application.

B. Prime substrate deck in accordance with manufacturers written installation instructions.

C. Install membrane with minimum 3" (76 mm) side laps and 6" (152 mm) end laps. At the end of each roll, install a 6" x 42" (152 mm x 1.07 m) sheet metal plate to support the end lap between deck ribs. Stagger the end laps 12" (305 mm).

D. Roll membrane in with a 75 lb (34 kg) roller to fully mate each roll to substrate, including all lap areas.

3.07 INSULATION AND COVER BOARD INSTALLATION
A. Install insulation in configuration and with attachment method(s) specified in PART 2.
B. Install only as much insulation as can be covered with the completed roofing system before the end of the day's work or before the onset of inclement weather.

C. Lay roof insulation in courses parallel to roof edges.

D. Neatly and tightly fit insulation to all penetrations, projections, and nailers, with gaps not greater than 1/4 inch (6 mm). Fill gaps greater than 1/4 inch (6 mm) with acceptable insulation. Do not leave the roofing membrane unsupported over a space greater than 1/4 inch (6 mm).

E. Mechanical Fastening: Using specified fasteners and TPO coated insulation plates engage fasteners through insulation into deck to depth and in pattern required by Factory Mutual for FM Class specified in PART 2 and membrane manufacturer, whichever is more stringent.

F. Stagger end joints.

3.08 ROOF MEMBRANE INSTALLATION

A. Install only as much insulation as can be covered with the completed roofing system before the end of the day's work or before the onset of inclement weather.

B. Lay out the membrane pieces so that field and flashing splices are installed to shed water.

C. Install membrane without wrinkles and without gaps or fishmouths in seams; bond and test seams and laps in accordance with membrane manufacturer's instructions and details.

D. Install membrane mechanically attached to the substrate using fasteners and edge securement as specified and as required by membrane manufacturers.

E. Induction welding equipment shall be provided by others but approved for use by Firestone Building Products for use with the InvisiWeld System. All roofing contractors intending to use the equipment shall have successfully completed a training course provided by a Firestone Building Products Technical Service Representative prior to welding.

1. Induction welding tool calibration: As per the tool manufacturer's printed guidelines, perform a tool calibration with induction welding tool, making test samples in the field with the TPO membrane and InvisiWeld plate. Before welding the membrane to the plates, calibrate the energy setting of the induction device following manufacturer's instructions. Perform a peel test, at different energy settings and set the device at the lowest energy setting that creates a 100% bond.

F. All membrane to be welded shall be clean and dry.

G. Induction welding of the membrane: Follow induction tool manufacturer's printed guidelines. Activate the weld between the TPO membrane and InvisiWeld plate using the electromagnetic induction device as supplied by others. The induction coil, demarked by a red circle on the device, must be positioned over the center of the InvisiWeld plate, ± 1
inch (25 mm). Cycle time will be affected by available power, use a heavy gauge power cord, at a minimum 12 gauge by 100 feet.

H. When the induction welding cycle is complete, immediately place a weighted magnetic cooling clamp over the welded TPO membrane & plate assembly. This will ensure that there is adequate clamping of the membrane to the plate during cooling, ensuring a good weld. The magnetic cooling clamp device must be left in place for a period of 60 seconds, at minimum, while the weld cools and sets.

I. Repeat Steps G and H for every plate in assembly.

J. Edge Securement: Secure membrane at all locations where membrane terminates or goes through an angle change greater than 2 in:12 inches (1:6 ) using mechanically fastened reinforced perimeter fastening strips, HD plates, or metal edging as indicated or as recommended by roofing manufacturer. Do not use InvisiWeld plates for edge securement.
   1. Exceptions: Round pipe penetrations less than 18 inches (460 mm) in diameter and square penetrations less than 4 inches (200 mm) square.
   2. Metal edging is not merely decorative; ensure anchorage of membrane as intended by roofing manufacturer.

3.09 FLASHING AND ACCESSORIES INSTALLATION

A. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by membrane manufacturer's recommendations and details.

B. Metal Accessories: Install metal edgings and copings in locations indicated on the drawings, with horizontal leg of edge member over membrane and flashing over metal onto membrane.
   1. Follow roofing manufacturer's instructions.
   2. Install water block sealant under the membrane anchorage leg.
   3. Flash with manufacturer's recommended flashing sheet unless otherwise indicated.
   4. Where single application of flashing will not completely cover the metal flange, install additional piece of flashing to cover the metal edge.

C. Scuppers: Set in sealant and secure to structure; flash as recommended by manufacturer and as indicated on drawings.

D. Flashing at Walls, Curbs, and Other Vertical and Sloped Surfaces: Install weathertight flashing at all walls, curbs, parapets, curbs and other vertical and sloped surfaces that the roofing membrane abuts to; extend flashing at least 8 inches (200 mm) high above membrane surface and as indicated on drawings.
   1. Use the longest practical flashing pieces.
   2. Evaluate the substrate and overlay and adjust installation procedure in accordance with membrane manufacturer's recommendations.
   3. Complete the splice between flashing and the main roof sheet with specified splice adhesive before adhering flashing to the vertical surface.
   4. Provide termination as shown on drawings.
E. Flashing at Penetrations: Flash all penetrations passing through the membrane; make flashing seals directly to the penetration.
   1. Pipes, Round Supports, and Similar Items: Flash with specified pre-molded pipe flashings wherever practical; otherwise use specified self-curing elastomeric flashing.
   2. Structural Steel Tubing: If corner radii are greater than 1/4 inch (6 mm) and longest side of tube does not exceed 12 inches (305 mm), flash as for pipes; otherwise, provide a standard curb with flashing.
   3. Flexible and Moving Penetrations: Provide weathertight gooseneck set in sealant and secured to deck, flashed as recommended by manufacturer.

3.10 WALKWAY INSTALLATION

A. Install roof walk at locations shown in accordance with manufacturer's recommendations.
   1. Provide starting from roof access hatch or door and reaching roof-mounted equipment requiring periodic service or monitoring, including around perimeter of such equipment.
   2. Walkway Pads: Adhere to the roofing membrane, spacing each pad at minimum of 1.0 inch (25 mm) and maximum of 3.0 inches (75 mm) from each other to allow for drainage.
      a. If installation of walkway pads over field fabricated splices or within 6 inches (150 mm) of a splice edge cannot be avoided, adhere another layer of flashing over the splice and extending beyond the walkway pad a minimum of 6 inches (150 mm) on either side.
      b. Prime the membrane, remove the release paper on the pad, press in place, and walk on pad to ensure proper adhesion.

3.11 FIELD QUALITY CONTROL

A. Manufacturer Quality Control:
   1. Technical representative of manufacturer to periodically (minimum 3 visits) observe Work in progress.
   2. Representative, as a minimum, to be present to observe deck preparation, general installation procedures and final completion.
   3. Notify Architect and Owner's Representative at least twenty-four (24) hours prior to any roofing Work.
   4. Work not to proceed until such observations have been made in field report and conditions have been approved in writing by Architect.
   5. Upon completion of installation to ascertain that entire systems has been installed according to manufacturer's specifications and approved details.

3.12 WARRANTY REINSPECTION

A. Two (2) months before expiration of warranty, reinspect work and make necessary repairs at no additional cost to Owner.
3.13 **CLEANING**

A. Clean adjacent materials and surfaces of any soilage by Work of this Section, and repair as necessary.

B. Upon completion of work of this Section, promptly remove from job-site debris, empty containers, and surplus materials derived from this portion of Work, and dispose of in a legal manner.

**END OF SECTION**
SECTION 07 62 00
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Fabricated sheet metal items, including flashings, counterflashings, gutters, downspouts, exterior penetrations, and other items indicated in Schedule.
B. Sealants for joints within sheet metal fabrications.

1.02 REFERENCE STANDARDS
F. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

1.03 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
C. Samples: Submit two samples, 12 by 12 inch in size illustrating material of typical standing seam.
D. Samples: Submit two samples 21 by 12 inch in size illustrating metal finish color.
E. Test Data: Provide test data for roof edge and coping attachment meeting: ANSI/SPRI/FM 4435/ES-1, RE-3 requirements.
1.04 QUALITY ASSURANCE
   A. Perform work in accordance with SMACNA (ASMM) requirements and standard details, except as otherwise indicated.
   B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 5 years of documented experience.

1.05 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 or staining.

1.06 WARRANTY
   A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
   B. Correct defective Work within a two year period after Date of Substantial Completion. Defective work includes degradation of metal finish and failure of watertightness or seals.
      1. Repair and/or replace without additional cost to Owner any water leaks and resulting damage to building materials as may occur under normal usage within warranty period.

PART 2 PRODUCTS

2.01 SHEET MATERIALS
   A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, (0.0239) inch thick base metal, shop pre-coated with PVDF coating.
      1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
      2. Color: As selected by Architect from manufacturer’s standard colors.
   B. Lead: ASTM B 749, 4 lb/sq ft thick.
   C. Stainless Steel: ASTM A 666 Type 304, soft temper; smooth No. 4 finish.

2.02 PERFORMANCE REQUIREMENTS
   A. Parapet Fascias and Copings: Minimum gage metals, fastener size and spacing to resist wind uplift per ANSI SPRI ES-1.

2.03 FABRICATION
   A. Field verify dimensions prior to fabrication.
   B. Form sections true to shape, accurate in size, square, and free from distortion or defects.
      1. Angle bottom edges of vertical surfaces to form drip.
   C. Fabricate cleats of same material as sheet, interlocking with sheet.
1. Gage: One gage heavier than sheet metal component being anchored.
2. Continuous cleat at outside face of coping.
3. Spaced cleats: Two (2) feet on center at inside of coping, minimum 4 inches wide.

D. Form pieces in longest possible lengths.
E. Hem exposed edges on underside 1/2 inch; miter and seam corners.
F. Form material with standing seams, except where otherwise indicated. At moving joints, use standing seam.
   1. Counter flashing: Double S Lock.

G. Seams:
   1. Standing seams: 1 inch high, with sealant at folded corners.
   2. Solder-Lap Seams: 1 inch finish width; sweat full with solder.
   3. Double S Lock Seams: Form 1-1/4 inch wide S shaped seam on each edge of flashing sheet for concealed fastening.
   4. Splice Plates: 12 inch long backing plate with 2 sealants beads each side of joint. No lapped joints permitted.

H. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
I. Sheet Metal Pipe Boot:
   1. Pipe and Penetration Flashing: Two piece interlocking of galvanized steel, compatible with pipe, membrane flashing and roof systems, and capable of accommodating pipes sized between 3/8 inch and 12 inch.
      a. Caps: EPDM.
      b. Metal Thickness: 22 gauge.
      c. Profile: As indicated on drawings.

J. Metal Roof Edging, Fascia and Copings: See Section 07 54 13 Thermoplastic Membrane Roofing.
K. Gauges: See Schedule.
L. Scuppers:
   1. Form as detailed.
   2. Lap field joints at conductor heads, and welded watertight.
   3. Scupper Flange: Lead, soldered to interior face of scupper.
   4. Install sealant around exposed flanges on roof side.

M. Manufactured Scupper Spout:
   2. Downspout Nozzle #1770, cast bronze body and flange.
   3. Location: As indicated on drawings.

2.04 GUTTER AND DOWNSPOUT FABRICATION

A. Downspouts: Square profile.
B. Accessories: Profiled to suit gutters and downspouts.
1. Anchorage Devices: In accordance with SMACNA (ASMM) requirements.
2. Downspout Supports: Brackets.

C. Washers: Neoprene cadmium plated.
D. Downspout Extenders: Same material and finish as downspouts.
E. Seal metal joints.

### 2.05 ACCESSORIES

A. Fasteners: Galvanized steel, with soft neoprene washers.
B. Rivets: Stainless steel, 1/8 inch diameter minimum
C. Screws: Self-tapping, stainless steel, pan head No. 7 x 1 inch minimum.
D. Self-Adhered Membrane Flashings: See Section 07 25 11 for high temperature membrane flashing under metal flashing.
E. Primer: Zinc chromate type.
F. Concealed Sealants: Non-curing butyl sealant.
G. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.
H. Sealant: Gutter seal by Alcoa.
I. Plastic Cement: ASTM D4586/D4586M, Type I.
J. Reglets: Surface mounted type, galvanized steel; face and ends covered with plastic tape.
K. Solder: ASTM B32; Sn50 (50/50) type.

### 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.

#### 3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.
B. Install surface mounted reglets true to lines and levels, and seal top of reglets with sealant.
C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

#### 3.03 INSTALLATION, GENERAL

A. Install work of this Section in accordance with:
1. Construction Documents.
2. Reviewed Shop Drawings
3. Anchor components firmly into position plumb, level and true.

B. Install Work watertight and weathertight, without oil canning, buckles, tool marks, fastening stresses, distortion, or defects which impair strength or mar appearance.

C. Install planes and lines in true alignment.

D. Allow for sheet metal expansion and contraction.
   1. Provide expansion 40 feet o.c. maximum unless otherwise noted.

3.04 INSTALLATION

A. Insert flashings into reglets to form tight fit; secure in place with lead wedges; pack remaining spaces with lead wool; seal flashings into reglets with sealant.

B. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.

C. Apply plastic cement compound between metal flashings and felt flashings.

D. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

E. Sealant Installation:
   1. Apply 1/4 inch diameter bead, centered in full length of Joints.

F. Soldering:
   1. Clean and flux metals prior to soldering.
   2. Solder metal joints for full metal surface contact, and after soldering wash metal clean with neutralizing solution and rinse with water.
   3. Perform soldering with a heavy soldering copper of blunt design, properly tinned for use.
      a. Perform soldering slowly, with a well heated surface and fill with solder.
   4. Do not solder coil-coated galvanized sheet steel.

G. Secure gutters and downspouts in place with concealed fasteners.

H. Connect downspouts to downspout boots, and seal connection watertight.

I. Cover fastener heads with cleat tabs folded back over fastener head.

J. Spaced cleats: Two (2) feet on center at inside of coping

K. Set splash pads under downspouts.

3.05 CLEAT INSTALLATION

A. Secure spaced cleats to substrate with 2 fasteners to prevent cleat rotation.

B. Secure continuous cleats to substrate with fasteners spaced at 12 inch maximum centers.

C. Cover fastener heads with cleat tabs folded back over fastener head.
3.06 CORROSION PROTECTION
   A. Protect galvanized steel against corrosion with asphaltic coating compound; 7-1/2 mil dry film thickness applied to each contacting face.

3.07 COUNTER FLASHING
   A. Overlap base flashing 4 inches minimum.
   B. Install bottom edge spring-tight against base flashing.
   C. Miter, and seal corner joints.

3.08 COPINGS
   A. Fabricate with standing seams spaces approximately 10 feet apart.
   B. Miter and join corners.
   C. Lock exterior edges over continuous cleats secured to substrate.
   D. Slope coping top toward roof.

3.09 ASPHALT PLASTIC CEMENT INSTALLATION
   A. Trowel apply 1/8 inch thick. See roofing Section for materials.

3.10 ROOF PENETRATION FLASHING
   A. General: Form of 4.0 lb/sq. ft. lead, hard tempered.
   B. Flashing: Seal top of flashing to pipes penetrating roof as detailed or recommended by roofing manufacturer.
   C. Storm Collar:
      1. Overlap base lead at least 1 inch with 24 gage prefinished metal storm collar sloped away from penetration.
      2. Secure to penetration with clamp and seal as detailed.

3.11 FIELD QUALITY CONTROL
   A. See Section 01 40 00 - Quality Requirements, for field inspection requirements.
   B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

3.12 CLEANING
   A. As Work progresses, neutralize excess flux with 5 percent to 10 percent washing soda solution, and thoroughly rinse.
   B. Clean exposed surfaces affected by Work of this Section.
   C. Remove from site refuse created by this work, and dispose of in a legal manner.
3.13 **SCHEDULE**

A. Sheet Metal Roof Expansion Joint Covers, and Roof-to-Wall Joint Covers: Pre-finished galvanized steel; 22 gage (0.0299 inch thick).

B. Eave Flashing: Pre-finished galvanized steel; 24 gauge (0.0239 inch thick).

C. Fascia and Cornices: 20 gauge (0.0359 inch thick).

D. Gutters and Downspouts: 22 gage (0.0299 inch thick)

E. Counterflashings at Roofing Terminations (over roofing base flashings):

**END OF SECTION**
PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 REFERENCE STANDARDS


1.03 ADMINISTRATIVE REQUIREMENTS

A. See Section 01 30 00 - Administrative Requirements, for pre-installation meeting procedures.
B. Convene two weeks before starting work of this section.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
   4. Substrates the product should not be used on.
   5. Substrates for which use of primer is required.
C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
D. Field Quality Control Plan: Submit at least two weeks prior to start of installation.
E. Field Quality Control Log: Submit filled out log for each length or instance of sealant installed, within 10 days after completion of inspections/tests; include bagged test samples and photographic records, if any.

1.05 QUALITY ASSURANCE

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

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

C. Field Quality Control Plan:
   1. Visual inspection of entire length of sealant joints.
   2. Destructive field adhesion testing of sealant joints, except interior acrylic latex sealant.
      a. For each different sealant and substrate combination, allow for one test every 100 feet in the first 1000 linear feet, and one test per 1000 linear feet thereafter, or once per floor on each elevation.
      b. If any failures occur in the first 1000 linear feet, continue testing at frequency of one test per 500 linear feet at no extra cost to Owner.
   3. Field testing agency's qualifications.
   4. Field Quality Control Log Form: Show same data fields as on Preinstallation Field Adhesion Test Log, with known information filled out and lines for multiple tests per sealant/substrate combinations; include visual inspection and specified field testing; allow for possibility that more tests than minimum specified may be necessary.

D. Field Adhesion Test Procedures:
   1. Allow sealants to fully cure as recommended by manufacturer before testing.
   2. Have a copy of the test method document available during tests.
   3. Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.
   4. If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Architect.

E. Field Adhesion Tests of Joints: Test for adhesion using most appropriate method in accordance with ASTM C1521, or other applicable method as recommended by manufacturer.

PART 2 PRODUCTS

2.01 JOINT SEALANT APPLICATIONS

A. Scope:
   1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
      a. Wall expansion and control joints.
b. Joints between door, window, and other frames and adjacent construction.
c. Joints between different exposed materials.
d. Openings below ledge angles in masonry.
e. Other joints indicated below.

2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
   a. Joints between door, window, and other frames and adjacent construction.
   b. In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.
   c. Other joints indicated below.

3. Do not seal the following types of joints.
   a. Intentional weepholes in masonry.
   b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
   c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
   d. Joints where installation of sealant is specified in another section.
   e. Joints between suspended panel ceilings/grid and walls.

B. Sound-Rated Assemblies: Walls and ceilings identified as "STC-rated", "sound-rated", or "acoustical".

2.02 JOINT SEALANTS - GENERAL

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

2.03 NONSAG JOINT SEALANTS

A. Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
   1. Applications: Use for:
      a. Joints between metal frames and other materials, including storefront systems.
      b. Joints using fluid applied weather barrier flashing.
   2. Movement Capability: Plus 100 percent, minus 50 percent, minimum.
   3. Color: To be selected by Architect from manufacturer's custom range.
   4. Manufacturers:
      c. Substitutions: See Section 01 60 00 - Product Requirements.

B. Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
   1. Applications: Use for:
      a. Joints between metal frames and other materials, including storefront systems.
      b. Joints using fluid applied weather barrier flashing.
3. Color: To be selected by Architect from manufacturer’s custom range.
4. Manufacturers:
   c. Substitutions: See Section 01 60 00 - Product Requirements.

C. Interior Concealed Perimeter Sealant: Silicone; ASTM C 920, Type S, Grade NS, uses NT, G, M, A and O; single component.
   1. Applications: Use for:
      a. Concealed Joints between door/windows and adjacent materials.
      b. Concealed Joints between metal frames and other materials.
   3. Products:
      b. Substitutions: See Section 01 60 00 - Product Requirements.

D. Acoustical Sealant for Concealed Locations:
   1. Applications: Use for concealed locations only:
      a. Sealant bead between top stud runner and structure and between bottom stud track and floor.
   2. Exposed and Concealed Joints:
      b. Pecora; AC-20 FTR Acoustical Sealant: www.pecora.com
      d. Substitutions: See Section 01 60 00 - Product Requirements.
   3. Concealed Joints:
      a. Pecora; AIS-919 Acoustical Sealant for non-rated assemblies or AC-20 FTR Acoustical Sealant for rated assemblies: www.pecora.com
      c. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 ACCESSORIES

A. Silicone Strips: Extruded elastomeric silicone profile.
   1. Extruded low modules elastomeric silicone:
      a. Tensile Strength: 400 psi per ASTM D412.
      b. Elongation: 400 percent per ASTM D412.
   2. Width: 4 inches.
   3. Application Between glazing pocket at Curtain Wall framing and rough opening.
   4. Color: [White]
   5. Products:

B. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
1. Bi-Cellular: Polyethylene foam rod, 25 to 33 percent larger in diameter than joint width.
2. Manufacturers:
   a. Bi-Cellular:
      1) Backer Rod Mfg, Inc.; Titan Foam.
   b. Substitutions: See Section 01 60 00 - Product Requirements.

C. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

D. Joint Protection:
   1. Manufacturer: Weathercap, Inc.
      b. Profile: Type A.

E. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

F. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

G. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

H. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.
B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.
E. Concrete and Masonry:
   1. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, or mechanical abrading; remove loose particles from cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
   2. Where surfaces have been treated, remove surface treatment by sandblasting or wire brushing.
   3. Remove laittance and mortar from masonry joint cavities
4. Remove laitance and form-release agents from concrete.

F. Metal surfaces:
   1. Clean steel surfaces with metal or wire brush to remove mill scale and rust.
      a. Prime surfaces as recommended by manufacturer.
   2. Clean nonporous surfaces with chemical cleaner which leaves no residue to remove oil and grease, and protective coatings, wiping surfaces with clean rags.

G. Protect elements surrounding the work of this section from damage or disfigurement.
   1. Use tape or other materials recommended by manufacturer to prevent contact of sealant with adjoining surfaces that would otherwise be permanently stained or damaged by such contact or by cleaning methods to remove sealant smears.
   2. Concrete sealed with water repellent. Protect joints prior to applying sealer or apply sealer after sealant is installed and cured.

H. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

A. Prepare Job Site Daily Log Reports.

B. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

C. Perform installation in accordance with ASTM C1193.

D. Perform acoustical sealant application work in accordance with ASTM C919.

E. Sealant Backings:
   1. Install material to uniform depth below sealant.
   2. Using tool, smoothly and uniformly place backup material to depth of approximately 1/2 joint width (1/4 inch minimum), compressing backup material 25 percent to 50 percent and securing a positive fit.
   3. Do not leave gaps between ends of sealant backings.
   4. Do not stretch, twist, puncture, or tear sealant backings.

F. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:
   2. Neck dimension no greater than 1/3 of the joint width.
   3. Surface bond area on each side not less than 75 percent of joint width.

G. Install bond breaker backing tape where backer rod cannot be used.

H. Primers: Use primer approved by manufacturer for substrates being sealed, in accordance with manufacturer's recommendations.

I. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
J. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

K. Mask joints where appearance of primer or sealant on adjacent surfaces would be objectionable.
   1. Provide dams where necessary to contain sealant.
   2. Remove masking tape immediately after tooling without disturbing joint seal.

L. Tool joints concave.
   1. Provide uniformly smooth joints with slightly concave surface, flush at edges with adjacent surface, according to ASTM C 1193, unless otherwise indicated.
   2. Do not use tooling agent unless specifically recommended in writing by sealant manufacturer.
   3. Leave sealant surface neat and smooth.

M. Apply two (2) beads of acoustical sealant to bottom of track.

3.04 FIELD QUALITY CONTROL

A. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.
   1. Contractor to perform testing.

B. Destructive Adhesion Testing: If there are any failures in first 1000 linear feet, notify Architect immediately.
   1. Attendees for test meeting:
      a. Sealant manufactures technical representative.
      b. Contractor
      c. Installer
      d. Architect
   2. Initial Performance Testing:
      a. Minimum four (4) locations and minimum two (2) at window perimeters in accordance with ASTM C1193 and as determined by Architect.
         1) Prepare substrate surface for sealant application.
         2) Install sealant joint.
         3) Allow proper sealant cure time.
         4) Knife cut across sealant joint and two inches along each side of joint.
         5) Pull sealant out of joint at angle less than 90 degrees from cut piece and joint.
   3. Follow-up Testing:
      a. First 1000 Linear Feet: One test every 100 linear feet as soon as sealant is cured.
      b. After first 1000 linear feet, if good results occur in first 1000 linear feet.
         1) One test per 1000 linear feet.
         2) One test per floor per elevation.
         3) One test per week per installation crew.
4. Testing Documentation:
   a. Date and location.
   b. Installed age of sealant.
   c. Test result, sealant failure type and degree of force (much or little).
   d. Dimension of bead configuration.

5. Test Success: Sealant separates from itself, cohesive failure, adhering to substrate and failing in bond to itself.

6. Test Failure: Sealants from substrate, failing in bond to substrate, adhesive failure.
   a. Repair field adhesion tests immediately after determining and documenting results.

C. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

D. Repair destructive test location damage immediately after evaluation and recording of results.

END OF SECTION