# Table of Contents Bid Specifications

## Albuquerque Housing Authority: *P1922 On-Call Painting and General Contractor Services*

## Section 00 11 00 Summary of Work – AHA

**DESCRIPTION**:

AHA is seeking one contractor, or multiple contractors, to complete Exterior Painting and General Contractor Services multiple identified projects. Each property will require exterior painting and may require general contractor services in preparation of exterior painting services.

In addition to the Exterior Painting and General Contractor Services projects specified, AHA anticipates awarding additional Exterior Painting and General Contractor Services projects to selected contractor(s) through the use of task orders as described in Section 2.1 of the RFP.

**End Section**

## SECTION 01 25 00 - PRODUCT OPTIONS AND SUBSTITUTIONS

### PART 1 GENERAL

1. RELATED DOCUMENTS
   a) Provisions established within the General and Supplementary General Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.

2. REQUIREMENTS INCLUDED
   a) Contractor's options in selection of products.
   b) Products list.
   c) Requests for substitution of products.
   d) Value engineered items.

3. OPTIONS
   a) Products Specified by Reference Standards or by Description Only: Any product meeting those standards.
   b) Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not specifically named within time frame specified herein.

4. PRODUCTS LIST ON SUBSTITUTION
   a) Transmit three copies of a list of major products which are proposed for installation, including name of manufacturer.
   b) Tabulate products by Specifications section number, title, and Article number.
   c) For products specified only by reference standards, give manufacturer, trade name, model catalog designation, and reference standards.
   d) Owner's Representative will reply in writing within fifteen days stating whether there is a reasonable objection to listed items. Failure to object to a listed item shall not constitute a waiver of requirements of Contract Documents.

5. LIMITATIONS ON SUBSTITUTIONS
   a) Substitutions will not be considered when indicated on shop drawings or product data submittals without separate formal request, when requested directly by subcontractor or supplier, or when acceptance will require substantial revision of Contract Documents.
   b) Substitute products shall not be ordered or installed without written acceptance.
   c) Only one request for substitution for each product will be considered. When substitution is not accepted, provide specified product.
   d) Owner's Representative will determine acceptability of substitutions.

6. REQUESTS FOR SUBSTITUTIONS
   a) Submit separate request for each substitution. Document each request with complete data substantiating compliance of proposed substitution with requirements of Contract Documents. Utilize substitution request form attached.
   b) Identify product by Specifications section and Article numbers. Provide manufacturer's name and address, trade name of product, and model or catalog number. List fabricators and suppliers as appropriate.
   c) Attach product data as specified in Section 01 33 00 - Submittals.
   d) Give cost data comparing proposed substitution with specified product.
   e) List availability of maintenance services, and replacement material.
   f) State effect of substitution on construction schedule, and changes required in other work or products.

7. CONTRACTOR REPRESENTATION
   a) Request for substitution constitutes a representation that Contractor has investigated proposed product and has determined that it is equal to or

superior in all respects to specified product and that the cost reduction offered is ample justification for accepting the offered substitution.

b) Contractor will provide same warranty for substitution as for specified product.
c) Contractor will coordinate installation of accepted substitute, making such changes as may be required for Work to be complete in all respects.
d) Contractor certifies that cost data presented is complete and includes all related costs under this Contract.

8. SUBMITTAL PROCEDURES
   a) Submit one pdf copy of request for substitution.
   b) Owner's Representative will review Contractor's requests for substitutions with reasonable promptness.
   c) During the bidding period, Owner's Representative will record acceptable substitutions in Addenda.
   d) After award of Contract, Owner's Representative will notify Contractor in writing of decision to accept or reject requested substitution, generally within fifteen working days.
   e) For accepted products, shop drawings, product data, and samples shall be submitted under provisions of Section 01 33 00- Submittals.

**END OF SECTION 01 25 00 - PRODUCT OPTIONS AND SUBSTITUTIONS**

**SUBSTITUTION REQUEST FORM** *(Contractor may supply their own form for substitutions for approval by owner's representative prior to contract.)*

SUBSTITUTION REQUEST

DATE: _____

ARCHITECT'S PROJECT NO: _____

PROJECT: _____

TO:

FROM: _____
_____
_____
_____

Contractor (Bidder) hereby requests acceptance of the following product or system as substitution in accordance with provisions of Section 01 25 00 of the Specifications:

1. SPECIFIED PRODUCT OR SYSTEM:
Substitution request for: _____
Specification Section No.:_____ Article: _____

2. SUPPORTING DATA:
Product data adequate for evaluation of the request for proposed substitution is attached (description of product, reference standard, performance and test data, specifications, drawings, photographs.)
Sample is attached.
Sample will be sent if requested.

3. QUALITY COMPARISON

| | SPECIFIED PRODUCT | SUBSTITUTION |
|---|---|---|
| Name, Brand: | _____ | _____ |
| Catalog No.: | _____ | _____ |
| Manufacturer: | _____ | _____ |
| Vendor: | _____ | _____ |
| Significant Variations: | _____ | _____ |

(Add Additional Sheets if Necessary)

4. Maintenance Service Available?: Yes _____ No _____
Spare Parts Source:_____
Warranty Provided?: Yes _____ No _____ Years _____
By Whom?: _____

5. REASON FOR NOT GIVING PRIORITY TO SPECIFIED ITEMS:
_____
_____
_____

6. EFFECT OF SUBSTITUTION:
Does the proposed substitution affect other work (adverse or otherwise):
No _____ Yes _____ (if yes, explain)
_____
_____
_____
_____
Substitution Changes Contract Time: No _____ Yes _____
Add/Deduct _____ Days
Substitution requires dimensional revisions or redesign of the work: No _____ Yes _____
(if yes, attach explanation data)
Saving of credit to Owner: $_____
Extra Cost to Owner: $_____

7. CONTRACTOR'S (BIDDER'S) STATEMENT OF CONFORMANCE OF PROPOSED SUBSTITUTION TO CONTRACT DOCUMENTS:

I/we have investigated the proposed substitution. I/we:

- believe that it is equal or superior in all respects including function, appearance and quality to specified product, except as stated above;
- will provide same warranty and servicing requirements as specified for specific product; have included complete cost data and implications of the substitution;
- will pay for changes to the building design and special inspection costs caused by the use of this product;
- will coordinate the incorporation of the proposed substitution in the work.

CONTRACTOR (Bidder): _____

Date: _____ By: _____

Answer all questions and complete all blanks - use "NA" if not applicable. Unresponsive or incomplete requests will be rejected.

Architectural's REVIEW AND ACTION:

Resubmit substitution request
Provide more information in the following areas:

_____

_____

Sign Contractor's (Bidder's) Statement of Conformance
Substitution is accepted
Substitution is accepted, with the following comments:

_____

_____

Substitution rejected
Substitution Request received too late

_____ Date: _____
Owner's Representative

## SECTION 01 26 63 - CHANGE ORDER PROCEDURES

### PART 1: GENERAL

1. RELATED DOCUMENTS
   a) Provisions established within the General and Supplementary General Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.

2. SECTION INCLUDES
   a) Procedures for processing Change Orders.

3. SUBMITTALS
   a) Preliminary Change Order (PCO) with substantiating back-up.
   b) Change Order (CO).

4. DOCUMENTATION OF CHANGE IN CONTRACT SUM OR CONTRACT TIME
   a) Maintain detailed records of work done on a time and material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs of changes in the Work.
   b) Document each quotation for a change in cost or time with sufficient data to allow evaluation of the quotation.
   c) Provide additional data to support computations.
      (1) Quantities of products, labor, and equipment.
      (2) Taxes, insurances and bonds.
      (3) General Conditions and Fee (only when applicable).
      (4) Schedule comparisons to show justification for any change in Contract Time.
      (5) Credit for deletions from Contract, similarly documented.
   d) Support each claim for additional costs, and for work done on a time and material basis, with additional information.
      (1) Origin and date of claim.
      (2) Dates and times work was performed, and by whom.
      (3) Time records and wage rates paid.
      (4) Invoices and receipts for products, equipment, and subcontracts, similarly documented.

5. PRELIMINARY PROCEDURES
   a) Owner's Representative may submit a Request for Pricing (RFP) or a Construction Directive (CD) which includes: Statement for the reason for the change, detailed description of change with supplementary or revised Drawings and Specifications, the project time for executing the change, and the period of time during which the requested price will be considered valid.
   b) The Owner's Representative will advise of minor changes in the Work not involving an adjustment to Contract Sum/Price or Contract Time as authorized by AIA A201, 1987 Edition, Paragraph 7.4 by issuing supplemental instructions on a Construction Directive (CD).

6. CHANGE PROCEDURES
   a) Preliminary Change Order (PCO):
      (1) For General Contractor to use to estimate cost of change and receive authorization to proceed.
      (2) Form explanation:
         (a) Item #1: Give a detailed description of the change in Scope of Work.
         (b) Item #2: Indicate the name of the form that initiated the PCO.
         (c) Item #3: Indicate the estimated cost for change in Scope of Work within a range of +/- 5%. If there is no cost impact, enter "0".
         (d) Item #4: The number of added days the change in Scope of Work will cause. If there is no time impact, enter "0".
         (e) Item #5: This signature line is used if work is already detailed in plans or specs.
         (f) Item #6: This signature line is used to expedite work in progress. When signed, General Contractor is to proceed immediately with the work, and is to prepare a Change Order with pricing documentation for approval.
         (g) Item #7: This signature line is used if a total cost rather than an estimate is required to make a decision. When signed, advises the General Contractor Not to Proceed with the Work, but to prepare a Change Order with pricing documentation for the Owner's approval.
      (3) General Contractor distribution:
         (a) Copy to AHA within five (5) days of known cost impact. (b) Thomas Gifford Architect
   b) Preliminary Change Order Tracking Log (PCOTL):
      (1) To be maintained by General Contractor Project Officer.
      (2) To be kept current and furnish an updated copy at each job meeting:
         (a) AHA

(c) Change Orders

(1) The Change Order shall have a copy of the Construction Directive and/or PCO attached, along with all backup necessary to substantiate the requested change.

(2) The Change Order will be directed to AHA for signature.

d) Change Order Tracking Log (COTL):

(1) To be maintained by General Contractor Project Manager.

(2) Copy monthly or more often, if necessary:

7. CORRELATION OF CONTRACTOR SUBMITTALS

a) Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order, adjust the Contract Sum as shown on Change Order.

b) 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.

c) Promptly enter changes in Project Record Documents.

## END OF SECTION 01 26 63 - CHANGE ORDER PROCEDURES

## SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS

### PART 1 GENERAL

A. Preconstruction meeting.

B. Progress meetings.

C. Construction progress schedule.

D. Progress photographs.

E. Submittals for review, information, and project closeout.

F. Number of copies of submittals.

G. Submittal procedures.

RELATED REQUIREMENTS

A. Document 00 72 00 - General Conditions: Dates for applications for payment.

B. Document 00 72 00 - General Conditions: Duties of the Construction Manager.

### PART 2 EXECUTION

2. PRECONSTRUCTION MEETING

A. Schedule meeting after Notice of Award.

B. Attendance Required:
   1. Owner.
   2. Architect.
   3. Contractor.

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

D. 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. PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at maximum 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.
   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. Maintenance of progress schedule.
   7. Corrective measures to regain projected schedules.
   8. Planned progress during succeeding work period.
   9. Maintenance of quality and work standards.
   10. Effect of proposed changes on progress schedule and coordination.
   11. Other business relating to Work.

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.

4. CONSTRUCTION PROGRESS SCHEDULE
   A. The Contractor shall actively participate in the creation of a "Tenant Relocation Plan." The Plan shall help determine the overall construction schedule, will guide production rates, and will be used to establish the Project Substantial Completion Date.
   B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
   C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
      1. Include written certification that major contractors have reviewed and accepted proposed schedule.
   D. Within 10 days after joint review, submit complete schedule.
   E. Submit updated schedule with each Application for Payment.

5. PROGRESS PHOTOGRAPHS
   A. Submit new photographs at least once a month, within 3 days after exposure.
   B. Photography Type: Digital; electronic files.
   C. Provide photographs of site and construction throughout progress of Work produced by knowledgeable field staff photographer, acceptable to Architect.
   D. 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.
   E. Take photographs as evidence of existing project conditions as many as necessary but a minimum of:
      1. Interior views – 6 per room.
      2. Exterior views – 1 per elevation.
   F. Views:
      1. Consult with Architect for instructions on views required.
      2. Provide factual presentation.
      3. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.
   G. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
      1. Delivery Medium: Provide link and access to web based storage service for photo storage throughout the duration of the project. Provide a DVD copy of all photographs to the Owner upon completion of the construction.
      2. File Naming: Include project identification, date and time of view, and view identification.

6. SUBMITTALS FOR REVIEW
   A. When the following are specified in individual sections, submit them for review:
      1. Product data.
      2. Shop drawings.
      3. Samples for selection.
      4. Samples for verification.
      5. Engineering drawings.
   B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
   C. Samples will be reviewed only for aesthetic, color, or finish selection.
   D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

7. SUBMITTALS FOR INFORMATION
   A. When the following are specified in individual sections, submit them for information:
      1. Design data.
      2. Certificates.
      3. Test reports.
      4. Inspection reports.
      5. Manufacturer's instructions.

6. Manufacturer's field reports.
7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner. No action will be taken.

8. 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:
1. Project record documents.
2. Operation and maintenance data.
3. Warranties.
4. Bonds.
5. Manufacturer's Field Inspection Reports.
6. Other types as indicated.

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

9. 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. Documents for Review:
1. Small Size Sheets, Not Larger Than 8-1/2 x 11 inches (215 x 280 mm): Submit the number of copies that Contractor requires, plus two copies that will be retained by Architect.
2. Larger Sheets, Not Larger Than 36 x 48 inches (910 x 1220 mm): Submit one reproducible transparency and one digital copy.

C. Documents for Information: Submit two copies.

D. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
1. After review, produce duplicates.
2. Retained samples will not be returned to Contractor unless specifically so stated.

10. SUBMITTAL PROCEDURES

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

B. Transmit each submittal with a copy of approved submittal form.

C. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.

D. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.

E. 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.

F. Schedule submittals to expedite the Project, and coordinate submission of related items.

G. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor. H.

Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.

I. Provide space for Contractor and Architect review stamps.

J. When revised for resubmission, identify all changes made since previous submission.

K. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

L. Submittals not requested will not be recognized or processed.

**END OF SECTION**

## SECTION 01 31 00 - Project Management and Coordination

### PART 1: GENERAL

1. RELATED DOCUMENTS
   a) Provisions established within the General and Supplemental General Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.

2. SUMMARY
   a) This section shall not be interpreted to relieve Contractor of his sole responsibility for supervision and coordination of all construction procedures as provided herein and in Contract Conditions.
   b) Provisions of this section are considered minimal for orderly and expeditious prosecution of Work.
   c) It is intent of Owner to complete Project on a building basis. Coordinate efforts of all Work on Project in manner to accomplish completed units including occupancy permits on this basis. Date of Completion and Final Acceptance are based by building.
   d) Related Sections
      (1) Section 01 31 00: Submittals
      (2) Section 01 32 16: Progress Schedules
      (3) Section 01 29 83: Testing Laboratory Services
      (4) Section 01 25 00: Product Options and Substitutions
      (5) Section 01 77 00: Contract Closeout
      (6) Section 01 74 00: Cleaning Up

3. ORDERING PRODUCTS
   a) Before ordering materials, equipment, custom or standard fabricated items, verify the following provisions:
      (1) Each item complies with Contract Documents
      (2) Each properly related to Work already completed
      (3) Shop drawings or others submittal confirm "1." and "2." above, and are approved by owner
      (4) Orders are placed and delivery dates are established allowing orderly execution of Work on schedule and not allowing untimely delivery of critically sensitive products before Project site conditions are satisfactory to receive them.

4. COORDINATION AMONG TRADES
   a) Initiate coordinating procedures at Project meetings before Work in field begins. Resolve scheduling, sequencing, interferences, and priorities of oncoming simultaneous Work among interested parties to achieve specified results, and to advance planned progress of Project.
   b) Continue coordinating procedures by actively controlling Project conditions as follows:
      (1) Verify products of all trades are stored in orderly fashion under conditions complying with manufacturer's instructions or specific requirements of relevant specification section whichever requirement is more stringent at planned locations.
      (2) Verify compliance of environmental conditions before, during, and after execution of Work, with manufacturer's instructions and specific requirements of relevant sections of these specifications.
      (3) Verify adherence to specified tolerances as Work progresses.
      (4) Inspect job conditions before one trade follows another.
   c) Continue coordinating effort as Work progresses. Make adjustments in planned procedures as changing job conditions require to achieve results specified and to best advance progress of Work. Immediately advise all parties involved including owner of required changes in construction schedule and planned procedure.

5. COORDINATION WITH RELATED WORK
   a) Require all trades to cooperate with related Work.
   b) Contractor and his subcontractors shall coordinate Work with separate contract work by Owner, if applicable, and with prior occupancy provisions required by Owner.

6. TRAFFIC MAINTENANCE AND CIRCULATION
   a) General
      (1) Maintain circulation of traffic, both pedestrian and vehicular, and access to all parts of site by fire-fighting apparatus during construction.
      (2) Access to site is from public streets. Confine parking and vehicle access as directed by Owner's Representative to accommodate operation of adjoining businesses and residences.
      (3) Access to occupied areas will be restricted during construction unless prior approval is obtained from Owner's Representative.

End of Section 01 31 00

## SECTION 01 31 19 - PROGRESS MEETINGS

### PART 1: GENERAL

1. RELATED DOCUMENTS
   a) Provisions established within the General and Supplementary General Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.

2. SECTION INCLUDES
   a) Scheduling and administration of progress meetings.
   b) Pre-installation conferences.

3. Owner's PROGRESS MEETINGS
   a) The Contractor and Owner's Representative will jointly schedule and administer regular weekly(minimum) or as requested by Owner construction, progress meetings, throughout progress of Work. Contractor will prepare agenda, and distribute notice of each meeting to participants.
   b) Contractor shall make physical arrangements.
   c) Contractor will preside at meetings.
   d) Location of Meetings: Contractor's field office.
   e) Attendance: Project Manager, job superintendent, subcontractors/suppliers as appropriate to agenda. Owner's Representative and professional consultants as appropriate.
   f) Anticipated Agenda.
      (1) Review compliance with safety standards.
      (2) Discuss compliance of project cleanliness.
      (3) Review of Work progress.
      (4) Field Observations, problems, and decisions.
      (5)Identification of problems which impede planned progress.
      (6) Review of Submittals schedule and status (Section 01 33 00 – Submittals).
      (7) Review of off-site fabrication and delivery schedule.
      (8) Maintenance of progress schedule. (Refer to Section 01 32 16 - Progress Schedules).
      (9)Corrective measures to regain project schedules.
      (10) Planned progress during succeeding work period.
      (11) Coordination of project progress.
      (12)Maintenance of quality and work standards.
      (13) Discussion of any outstanding Request for Pricing (RFP), Construction Directives (CD), Request for Information (RFI), Preliminary Change Order Requests (PCOR), or Change Orders (CO).
      (14) Issue Request for Information Tracking Log (RFITL), Preliminary Change Order Request Tracking Log (PCORTL), or Change Order Tracking Log (COTL), as needed.
      (15) Effect of proposed changes on progress schedule and coordination.
      (16) Other business relating to Work.
   g) Contractor will record and distribute minutes of each meeting to all parties within three (3) work days.

4. Subcontractor progress meetings
   a) The Contractor will schedule and administer regular construction progress meetings, throughout progress of Work. He will prepare agenda, and distribute notice of each meeting to participants.
   b) Contractor shall make physical arrangements.
   c) Contractor will preside at meetings.
   d) Location of Meetings: Contractor's field office.
   e) Attendance: Project Manager, job superintendent, subcontractors/suppliers as appropriate to agenda.
   f) Anticipated Agenda.
      (1) Review of Work progress.
      (2) Field Observations, problems, and decisions.
      (3)Identification of problems which impede planned progress.
      (4) Review of Submittals schedule and status of submittals. Refer to Section 01 31 00 - Submittals for submittal's log.
      (5) Review of off-site fabrication and delivery schedule.
      (6) Maintenance of progress schedule. Refer to Section 01 32 16 Progress Schedules.

(7) Corrective measures to regain project schedules.
(8) Planned progress during succeeding work period.
(9) Coordination of project progress.
(10) Maintenance of quality and work standards.
(11) Effect of proposed changes on progress schedule and coordination.
(12) Other business relating to Work.

g) Contractor will record and distribute minutes of each meeting to all parties within three (3) work days of next progress meeting.

5. Subcontractor pre-installation conferences

a) As required by specific specification Sections, convene a pre-construction conference at work site prior to commencing work of the Section.
b) Require attendance of entities directly affecting, or affected by, work of the Section.
c) Prepare agenda and preside at conference.
d) Review conditions of installation, preparation and installation procedures, and coordination with related work.
e) Coordinate with Owner for timing so that Owner's Representative may be present.
f) Contractor will record and distribute minutes of each meeting to all affected parties and Owner's Representative within three (3) work days.
g) Submit Schedule of Pre-construction Conferences within thirty (30) days of Notice to Proceed.

**END OF SECTION 01 31 19 - PROGRESS MEETINGS**

# SECTION 01 32 00 – CONSTRUCTION PROGRESS DOCUMENTATION

## PART 1: GENERAL

1. RELATED DOCUMENTS
   a) Provisions established within the General and Supplementary General Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.

2. SECTION INCLUDES
   a) Procedures for preparation and submittal of construction Progress Schedules.

3. FORMAT
   a) Prepare schedule as approved by the Owner's Representative.
      (1) An activity for each G703 line item.
      (2) Milestone for each rough and final inspection.
      (3) Milestone for temporary certificate of occupancy and certificate of occupancy.
      (4) Milestone for Owner's acceptance and turnover.
      (5) Activity for punchlist correction both for contractor's and Owner's punchlist.

4. CONTENT
   a) Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

5. REVISIONS TO SCHEDULES (Bi-MONTHLY)
   a) Indicate progress of each activity to date of submittal, and projected completion date of each activity.
   b) Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
   c) Provide narrative report to define problem areas, anticipated delays, actual delays, and impact on Schedule. Report corrective action taken, or proposed, and its effect.

6. SUBMITTALS
   a) Submit initial Schedules with bidding documents.
   b) Submit revised Progress Schedules at each job meeting and with each Application for Payment.
   c) Distribution: One (1) copy each to Owner's Representative, field office at project site, and inspecting consultant.

7. DISTRIBUTION
   a) Distribute copies of reviewed Schedules to job site file, subcontractors, suppliers, and other concerned entities.
   b) Instruct recipients to promptly report, in writing, problems anticipated by projections in Schedules.

**END OF SECTION 01 32 00 – CONSTRUCTION PROGRESS DOCUMENTATION**

## SECTION 01 32 16 - CONSTRUCTION PROGRESS SCHEDULE

### PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preliminary schedule.

B. Construction progress schedule, bar chart type.

1.02 SCHEDULE FORMAT

A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.

B. Diagram Sheet Size: Maximum 22 x 17 inches (560 x 432 mm) or width required. C. Sheet Size: Multiples of 8-1/2 x 11 inches (216 x 280 mm).

### PART 2 PRODUCTS - NOT USED

### PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE

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

3.02 CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each unit and by each element of construction and construction trade.

B. Identify work of separate stages and other logically grouped activities. C. Include conferences and meetings in schedule.

D. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.

E. Indicate delivery dates for owner-furnished products. F. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS

A. Include a separate bar for each unit or groups of units and for major portions of Work or operation.

B. Identify the first work day of each week.

3.04 REVIEW AND EVALUATION OF SCHEDULE

A. Participate in joint review and evaluation of schedule with Architect and Owner at each submittal.

B. Evaluate project status to determine work behind schedule and work ahead of schedule. C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.05 UPDATING SCHEDULE

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity.

C. Annotate diagrams to graphically depict current status of Work.

D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

E. Indicate changes required to maintain Date of Substantial Completion. F. Submit reports required to support recommended changes.

G. Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect .

**3.06 DISTRIBUTION OF SCHEDULE**

A. Distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Architect, Owner, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

**END OF SECTION**

# SECTION 01 32 21 - OWNER PRE-CONSTRUCTION CONFERENCE

## PART 1 - GENERAL

1. RELATED DOCUMENTS
   a) Provisions established within the General and Supplementary General Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.

2. SECTION INCLUDES
   a) Contractor participation in pre-construction conferences.

3. PRECONSTRUCTION CONFERENCE
   a) Owner's Representative will schedule conference within 15 days after Notice to Proceed.
   b) Attendance: Owner's Representative and General Contractor to include principal, project manager, and superintendent.
   c) Agenda
      (1) Submit list of:
         (a) Subcontractors
         (b) List of products
         (c) Schedule of values
         (d) Progress schedule
         (e) Submittal schedule.

      (2) Designation of responsible personnel (should be in attendance).

      (3) Procedures and processing of:
         (a) Field Decisions
         (b) Submittals And Submittal Log
         (c) Substitutions
         (d) Applications For Payment
         (e) Requests For Pricing
         (f) Change Orders And Log
         (g) Preliminary Change Orders Request And Log
         (h) Requests For Information And Log
         (i) Contract Closeout Procedures
         (j) SK Drawings And Logs

      (4) Scheduling

      (5) Use of premises by Owner and Contractor

      (6) Owner's requirements

      (7) Temporary facilities

      (8) Safety program including, but not limited to, fall protection

      (9) Procedures for maintaining Material Safety Data Standards (MSDS) documents

      (10) Survey and building layout

      (11) Security and housekeeping procedures

      (12) Schedules

      (13) Procedures for testing

      (14) Procedures for maintaining record documents

      (15) Turnover procedures

      (16) Closeout procedures

      (17) Project Meetings
         (a) Agenda
         (b) Minutes

      (18) Mock-ups

## SECTION 01 32 33 - PHOTOGRAPHIC DOCUMENTATION

### PART 1 - GENERAL

1. RELATED DOCUMENTS

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

2. SUMMARY

   A. Section includes administrative and procedural requirements for the following:

      1. Preconstruction photographs.
      2. Periodic construction photographs.
      3. Final completion construction photographs.
      4. Periodic construction video recordings.
      5. Web-based construction photographic documentation.

   B. Related Requirements:
      1. Division 01 Section "Submittal Procedures" for submitting photographic documentation.
      2. Division 01 Section "Closeout Procedures" for submitting photographic documentation as project record documents at Project closeout.
      3. Division 01 Section "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

3. INFORMATIONAL SUBMITTALS

   A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph or video recording. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.

   B. Digital Photographs: Submit image files within three days of taking photographs.
      1. Digital Camera: Minimum sensor resolution of 8 megapixels.
      2. Format: Minimum 3200 by 2400 pixels, in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of photograph, accompanied by key plan file.
      3. Identification: Provide the following information with each image description in file metadata tag:
         a. Name of Project.
         b. Name and contact information for photographer. c. Name of Architect.
         d. Name of Contractor.
         e. Date photograph was taken.
         f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
         g. Unique sequential identifier keyed to accompanying key plan.

4. USAGE RIGHTS

   A. Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

### PART 2 - PRODUCTS

1. PHOTOGRAPHIC MEDIA
   A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 8 megapixels, and at an image resolution of not less than 3200 by 2400 pixels.
   B. Digital Video Recordings: Provide high-resolution, digital video disc in format acceptable to

Architect.

**PART 3 - EXECUTION**

2. CONSTRUCTION PHOTOGRAPHS

A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.

1. Maintain key plan with each set of construction photographs that identifies each photographic location.

B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

1. Date and Time: Include date and time in file name for each image.
2. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to Architect and Construction Manager.

C. Preconstruction Photographs: Before starting construction, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect.

1. Take 20 photographs to show existing conditions adjacent to property before starting the Work.
2. Take 20 photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
3. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.

D. Periodic Construction Photographs: Take 20 photographs monthly, coinciding with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

1. Vantage Points: Following suggestions by Architect and Contractor, photographer to select vantage points. During each of the following construction phases, take not less than two of the required shots from same vantage point each time to create a time-lapse sequence as follows:
   a. Commencement of the Work, through completion of subgrade construction. b. Above-grade structural framing.
   c. Exterior building enclosure.
   d. Interior Work, through date of Substantial Completion.

E. Final Completion Construction Photographs: Take 20 color photographs after date of Substantial Completion for submission as project record documents. Architect will inform photographer of desired vantage points.

1. Do not include date stamp.

F. Additional Photographs: Architect may request photographs in addition to periodic photographs specified. Additional photographs will be paid for by Change Order and are not included in the Contract Sum.

1. Three days' notice will be given, where feasible.
2. In emergency situations, take additional photographs within 24 hours of request.
3. Circumstances that could require additional photographs include, but are not limited to, the following:
   a. Special events planned at Project site.
   b. Immediate follow-up when on-site events result in construction damage or losses. c. Photographs to be taken at fabrication locations away from Project site.
   d. Substantial Completion of a major phase or component of the Work.
   e. Extra record photographs at time of final acceptance.

3. CONSTRUCTION VIDEO RECORDINGS

A. Video Recording Photographer: Engage a qualified videographer to record construction video recordings.

B. Recording: Mount camera on tripod before starting recording unless otherwise necessary to show area of construction. Display continuous running time and date. At start of each video recording, record weather conditions from local newspaper or television and the actual temperature reading at Project site.

C. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed, recent events, and planned activities. At each change in location, describe vantage point, location, direction (by compass point), and elevation or story of construction.

1. Confirm date and time at beginning and end of recording.
2. Begin each video recording with name of Project, Contractor's name, videographer's name, and Project location.

D. Transcript: Provide a typewritten transcript of the narration. Display images and running time captured from video recording opposite the corresponding narration segment.

**END OF SECTION 01 32 33 PHOTOGRAPHIC DOCUMENTATION**

# SECTION 01 33 00 - SUBMITTALS

## PART 1: GENERAL

1. RELATED DOCUMENTS
   a) Provisions established within the General and Supplementary General Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.
   b) Reference Section 01 25 00 - Product Options and Substitutions, for substitutions and National Purchase Agreements.
2. SUMMARY
   a) General Provisions
      (1) Provisions in this section are mandatory procedures for preparing and submitting samples, shop drawings, and product data.
      (2) Job delays occasioned by requirement of resubmission of samples, shop drawings, and product data not in accord with Contract Documents are Contractor's responsibility, and will not be considered valid justification for extension of time.
   b) Submittal Log:
      (1) Contractor to complete attached submittals log and submit proposed submittal schedule to Owner's Representative for review within fifteen calendar days following Notice to Proceed.
      (2) Schedule purpose is to:
         (a) Demonstrate that submittals, shop drawings, data, samples and mock-ups required for Work are addressed by Contractor.
         (b) Demonstrate consistency with Contractor's proposed Progress Schedule.
         (c) Assist Owner's Representative in scheduling timely review/approval action of submittals.
      (3) Schedule contents: Description of submitted item, proposed date of submittal or availability for review by Owner's Representative and proposed date of requested return by Owner's Representative, allowing twenty work days for Owner Processing.
      (4) Within fifteen calendar days after Owner's Representative receipt of submittal schedule, Owner's Representative and Contractor shall jointly review schedule and mutually agree to acceptability or necessary modifications.
      (5) Submit accepted schedule within ten calendar days after joint review date.

3. MOCK-UPS - ALL SYSTEMS
   a) Furnish and install "Z" shaped mock-up depicting building inside and outside corner which includes but is not limited to the following systems:
      (1) Framing.
      (2) Sheathing.
      (3) Stucco and accessories.
      (4) Roofing.
      (5) Painting.
      (6) Window / door frames.
   b) Mock-ups to remain on-site until final project completion.
   c) Accepted mock-ups to represent standard of quality for the project.
   d) Mock-ups to be approved by Owner's Representative prior to commencement of building construction.
4. SAMPLE PREPARATION
   a) Prepare samples in sizes, shapes, and finishes in accord with provisions of individual specification sections.
   b) Samples furnished under this section are not to be confused with full size, on-the-site "Mock-Ups" called for in some specification sections.
   c) Number of samples submitted: Three (3): Two (2) required by Contractors, plus one (1) which will be retained by Owner, unless otherwise indicated.
   d) Samples Requiring Color Selection
      (1) Submit at earliest practical time.
      (2) No color selections will be made until all colors can be chosen and issued at one time in form of color schedule.
      (3) Approvals and color selections will not be made unilaterally where samples or selections regarding adjacent materials must be made for aesthetic purposes.
5. SHOP DRAWING PREPARATION
   a) Conform to the Following Requirements
      (1) Number sheets consecutively.
      (2) Indicate working and erection dimensions and relationships to adjacent work. Concurrent submittals of different aspects of work may be required by Owner's

Representative as deemed necessary to demonstrate Contractor's ability to understand these relationships and coordinate Work.

(3) Indicate:
(a) Arrangements and section views, as applicable.
(b) Material, gauges, thicknesses, finishes, and characteristics.
(c) Anchoring and fastening details: include information for making connections to adjacent work.
(4) Provide 3" by 3" clean space in the lower right hand area for entry of the Contractor's and the Architecturals stamp.
(5) Cross-reference drawing details and specification paragraphs applicable to submitted data.

b) Submit blue line copies of shop drawings. Provide copies as follows:
(1) Number required by Contractor for coordination and execution of Work.
(2) Two (2) copies for Owner, and Owner Representative's files..
(3) Copies retained by Architect as follows:
(a)Work designed by engineers or other consultants -- two copies.
(b)All other work -- one copy.

6. PRODUCT DATA PREPARATION
a) Include product manufacturer's standard printed material, dated, with product description and installation instructions indicated: delete data not related to this Project or mark "VOID" as applicable.
b) Number of copies submitted: Number required by Contractor plus two which will be retained by Owner's Representative, and one (1) copy per reviewing architect/engineer consultant.

7. CONTRACTOR'S REVIEW
a) Review submittals and stamp with approval action stamp containing Contractor's name, work "Approved", signed initials of approving agent, date of approval action, review notes, comments, and corrections required prior to submission to Owner's Representative. By so noting, Contractor indicates that he has reviewed and approved materials, equipment, quantities, and field verified dimensions represented by particular submittal.
b) Contractor represents by submitting samples, shop drawings, and product data that he has complied with provisions specified above. Submissions made without Contractor's approval indicated thereon will be returned without being reviewed for compliance with this requirement.
c) Date each submittal indicating name of Project, Architect, Engineer, Contractor, Subcontractor, as applicable description or name of equipment, material, or product and identify Work use location.
d) Accompany submittal with transmittal letter containing project name, Contractor's name, number of samples or drawings, titles, and other pertinent data. Outline deviations, if any, in submittals from requirements of Contract Documents.

8. ARCHITECT'S REVIEW
a) Review submittal with reasonable promptness to cause no delay in Work.
b) Review is only for conformance with design concept of project and information in Contract Documents. Review of separate item shall not indicate approval of an assembly in which item functions.
c) Architect will return submittals to Owner's Representative for distribution.

9. RESUBMISSION
a) Make corrections and changes indicated for unapproved submissions -- resubmit in same manner as specified above until Architect's or Owner's approval is obtained.
b) Direct specific attention to revisions other than corrections requested by Architect on previous submissions, if any, in resubmission transmittal.

10. DISTRIBUTION
a) Contractor is responsible for obtaining and distributing copies of submittal to his Subcontractors and material suppliers.
b) Maintain orderly file of all approved submittals bearing Architect's, Engineer's, or Owner's stamp for Project duration -- deliver to Owner's Representative as part of Project closeout documents.

**End of Section 01 33 00 - SUBMITTALS**

## SECTION 01 40 00 - QUALITY REQUIREMENTS

### PART 1: GENERAL

A. Submittals.

B. Quality assurance.

C. References and standards.

D. Testing and inspection agencies and services.

E. Control of installation.

F. Mock-ups.

G. Manufacturers' field services.

H. Defect Assessment.

1.02 RELATED REQUIREMENTS

A. Section 01 2100 - Allowances: Allowance for payment of testing services.

B. Section 01 4216 - Definitions.

1.03 REFERENCE STANDARDS

A. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2010.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. 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. Conformance with Contract Documents.
   k. When requested by Architect, provide interpretation of results.

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

1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

E. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.

1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

F. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.

1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.05 QUALITY ASSURANCE

A. Testing Agency Qualifications:

1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials

Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

3. Qualification Statement: Provide documentation showing testing laboratory is accredited under IAS AC89.

1.06 REFERENCES AND STANDARDS

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

B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.07 TESTING AND INSPECTION AGENCIES AND SERVICES

A. Owner will employ services of an independent testing agency to perform certain specified testing; payment for cost of services will be derived from allowance specified in Section 01 2100; see Section 01 2100 and applicable sections for description of services included in allowance.

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

**PART 2 EXECUTION**

2.01 CONTROL OF INSTALLATION

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

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

2.02 MOCK-UPS

A. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.

B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

C. Accepted mock-ups shall be a comparison standard for the remaining Work.

D. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

2.03 TESTING AND INSPECTION

A. Testing Agency Duties:

1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.

2. Perform specified sampling and testing of products in accordance with specified standards.
3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
4. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
5. Perform additional tests and inspections required by Architect.
6. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:
1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the Work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the Work.

C. Contractor Responsibilities:
1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
3. Provide incidental labor and facilities:
a. To provide access to Work to be tested/inspected.
b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
c. To facilitate tests/inspections.
d. To provide storage and curing of test samples.
4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

D. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.

E. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

2.04 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment and _____as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

2.05 DEFECT ASSESSMENT

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

B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

**END OF SECTION**

## SECTION 01 41 00 - REGULATORY REQUIREMENTS

### PART 1 GENERAL

1.01 SUMMARY

A. Regulatory requirements applicable to this project are the following:

B. 28 CFR 35 - Department of Justice accessibility regulations relating to State and local governments; current edition.

C. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.

D. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

E. FED-STD-795 - Uniform Federal Accessibility Standards; 1988.

F. 29 CFR 1910 - Occupational Safety and Health Standards; current edition; as a work place.

G. ICC A117.1 - Accessible and Usable Buildings and Facilities; International Code Council; 2009 (ANSI).

H. ICC (IBC) - ICC International Building Code, 2012.

I. Plumbing Code: 2012 Uniform Plumbing Cide.

J. Mechanical Code: 2012 Uniform Mechanical Code.

K. Fuel Gas Code: _____.

L. NFPA 70 - National Electrical Code; 2014.

M. ICC (IECC) - ICC International Energy Conservation Code, 2012.

N. Existing Building Code: IEBC International Existing Building Code, 2009.

O. Erosion and Sedimentation Control Regulations: _____.

**END OF SECTION**

# SECTION 01 42 00 - REFERENCE STANDARDS

## PART 1: GENERAL

1.RELATED DOCUMENTS

a) Provisions established within the Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.

2. REQUIREMENTS INCLUDED

a) Applicability of Reference Standards.

b) Provision of Reference Standards at site.

c) Acronyms used in Contract Documents for Reference Standards. Source of Reference Standards.

3. QUALITY ASSURANCE

a) For products of workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

b) The date of the standard is the most current edition that is in effect as of the Bid date, or date of

Owner-Contractor Agreement when there are no bids, except when a specific date is specified.

c) When required by individual Specifications section, obtain copy of standard. Maintain copy at job site during submittals, planning, and progress of the specific work, until Completion.

1. SCHEDULE OF REFERENCES

| | |
|---|---|
| AA | Aluminum Association |
| AAMA | American Architectural Manufacturer's Association |
| ACI | American Concrete Institute |
| AGA | American Gas Association |
| AHA | American Hardboard Association |
| AIA | American Institute of Architects |
| AISC | American Institute of Steel Construction |
| AISI | American Iron and Steel Institute |
| ALSC | American Lumber Standards Committee |
| ANSI | American National Standards Institute |
| APA | American Plywood Association |
| ASHRAE | American Society of Heating, Refrigerating and Air Conditioning Engineers |
| ASME | American Society of Mechanical Engineers |
| ASPA | American Sod Producers Association |
| ASPE | American Society of Plumbing Engineers |
| ASTM | American Society for Testing and Materials |
| AWWA | American Water Works Association |
| AWI | Architectural Woodwork Institute |
| AWPA | American Wood-Preservers' Association |
| AWPB | American Wood Preservers Bureau |
| AWS | American Welding Society |
| BHMA | Builders Hardware Manufacturers Association |
| CFF | Code of Federal Regulations |
| CISCA | Ceiling and Interior Systems |
| CPSC | Consumer Product Safety Commission |
| CRSI | Concrete Reinforcing Steel Institute |
| CTI | Ceramic Tile Institute of America |
| DHI | Door and Hardware Institute |
| EPA | Environmental Protection Agency |
| FGMA | Flat Glass Marketing Association |
| FM | Factory Mutual Engineer "G" and Research |
| FS | Federal Specification |
| GA | Gypsum Association |
| NAAMM | National Association of Architectural Metal Manufacturers |
| NECA | National Electrical Contractors Association |
| NEMA | National Electrical Manufacturer's Association |
| NFPA | National Fire Protection Association |
| NFPA | National Forest Products Association |
| NKCA | National Kitchen Cabinet Association |
| NPCA | National Paint and Coatings Association |

| | |
|---|---|
| NRCA | National Roofing Contractors Association |
| OSHA | Occupational Safety and Health Administration |
| PCA | Portland Cement Association |
| PDI | Plumbing and Drainage Institute |
| PS | Product Standard |
| PTI | Post Tension Institute |
| SDI | Steel Door Institute |
| SIGMA | Sealed Insulating Glass Manufacturers Association |
| SMACNA | Sheet Metal and Air Conditioning Contractors National Association |
| SPIB | Southern Pine Inspection Bureau |
| SSPC | Steel Structures Painting Council |
| TCA | Tile Council of America, Inc. |
| UL | Underwriter's Laboratories, Inc. |
| UPC | Uniform Plumbing Code |
| WCLIB | West Coast Lumber Inspection Bureau |
| WWPA | Western Wood Products Association |

**END OF SECTION 01 42 00 - REFERENCE STANDARDS**

# SECTION 01 45 23 - TESTING & INSPECTING SERVICES

## PART 1: GENERAL

1. SUMMARY
   a) Related Documents
   b) Provisions established within the General and Supplementary General Conditions of the Contract, Division I - General Requirements, and the Drawings collectively applicable to this Section.
2. SECTION INCLUDES
   a) Owner provided testing laboratory services.
   b) Selection and payment.
   c) Laboratory responsibilities.
   d) Laboratory reports.
   e) Limits on testing laboratory authority.
   f) Contractor responsibilities.
   g) Schedule of inspections and tests.
3. SELECTION AND PAYMENT
   a) Contractor will employ services of an independent testing laboratory to perform specified inspection and testing. Contractor will be paid by Owner.
   b) Employment of testing laboratory shall in no way relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents. Contractor will pay all testing required by local authorities having jurisdiction.
4. LABORATORY RESPONSIBILITIES
   a) Test samples of mixes submitted by Contractor.
   b) Provide qualified personnel at site. Cooperate with Contractor and Inspecting A/E in the performance of services.
   c) Perform specified inspection, sampling and testing of products in accordance with specified standards.
   d) Ascertain compliance of materials and mixes with requirements of Contract Documents.
   e) Promptly notify Owner's Representative of observed irregularities or non-conformance of Work or product.
   f) Perform additional inspections and tests required by Owner's Representative.
5. LABORATORY REPORTS
   a) After each inspection and test, promptly submit one copy of laboratory report to Architect, Owner's Representative, applicable consultants, and to Contractor. Include: Date issued, Project title and number, name of inspector, date and time of sampling or inspection, identification of product and Specifications section, location in the Project, type of inspection or test, date of test, results of tests, and conformance with Contract Documents. When requested by Inspecting A/E, Engineer, Contractor, or Owner provide interpretation of test results.
   b) Make written recommendations of procedures to correct unforeseen conditions not addressed in soils reports.
      (1) Such recommendations must be approved in writing by Owner's Representative prior to implementation.
6. LIMITS ON TESTING LABORATORY AUTHORITY
   a) Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   b) Laboratory may not approve or accept any portion of the Work, unless approved by Owner's Representative.
   c) Laboratory may not assume any duties of Contractor.
   d) Laboratory has no authority to stop Work, unless otherwise approved by Owner's Representative.
7. CONTRACTOR RESPONSIBILITIES
   a) Provide adequate samples of materials proposed to be used which require testing, together with proposed mix designs.
   b) Cooperate with laboratory personnel, and provide access to Work and to manufacturer's facilities.
   c) Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, and for storage and curing of test samples.
   d) Notify laboratory of materials sources and furnish necessary quantities of representative samples of materials proposed for use which are required to be tested.
   e) Notify Owner's Representative and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.
   f) Advise laboratory in a timely fashion to complete required inspection and testing prior to subsequent work being performed.
   g) Pay for all subsequent testing of products or systems found to be defective or otherwise not in accordance with specification requirements. Remove rejected products and replace with products of specified quality.

## PART 2: PRODUCTS

A) Not applicable to this section.

**PART 3: EXECUTION**

1. EARTHWORK (SITE GENERAL)

a) Make necessary soil tests (Atterberg Limit Series and ASTM D698 Standard Proctor) to determine moisture content and density of existing subgrade. Perform necessary soil tests (Atterberg Limit Series and ASTM D698 Standard Proctor for each type of fill specified) to determine the moisture content of existing subgrade and to inspect and test the placement of additional fill lifts to verify that all fill materials used are in accordance with the specifications for that use. Perform one field density test (ASTM D2922) per 10,000 S.F. of site area in the area affected on each lift prior to placement of additional fill material.

2. TRENCHING

a) Make necessary soil compaction tests in all trenching.

3. PAVING SUBGRADE STABILIZATION

a) Perform one subgrade in-place density test per 7,500 S.F. of subgrade, after subgrade preparation is complete at locations determined by the soils engineer, in accordance with ASTM D2922 and ASTM D3017. Perform tests within 48 hours of placement of pavement construction.

4. BUILDING SUBGRADE STABILIZATION

a) Make necessary soils tests (Atterberg Limit Series and ASTM D698 Standard Proctor for each type of fill specified) to determine the moisture content and density of existing subgrade and inspect and test the placement of additional fill lifts to verify that all fill materials used are in accordance with the specifications for that use. Perform one field density test (ASTM D2922) for each 5,000 S.F. of area within the building footprint on each lift prior to placement of additional fill material.

5. FORMWORK, REINFORCING STEEL AND INSERTS

a) Prior to each concrete pour, inspect formwork for tightness of joints, proper shoring and bracing, and beam size in accordance with ACI 347.

b) Prior to each concrete pour, inspect fabrication and bending of bars, bar sizes, spacing, placement and tying to accordance with ACI 315.

c) Prior to each concrete pour, inspect positioning of steel inserts, assemblies, sizes and spacing.

6. CAST-IN-PLACE CONCRETE

a) Design Mixes

(1) All concrete mixtures to be reviewed by the Design Engineer and/or the testing laboratory.

(2) At the beginning of the work Contractor shall submit proposed concrete mixes, including test results, for review by the Owner's Representative and testing laboratory, including the sieve analysis of fine and course aggregate ASTM C-136, dry rodded weight of coarse aggregate - ASTM C-29, and the specific gravity (bulk saturated surface dry), of fine and coarse aggregates ASTM C127 and C128. Laboratory, Architectural, Contractor, and Owner's Representative will review and make mix modification recommendations.

(3) Do not mix concrete for placing in the work until after laboratory reports reflect that each proposed mix will develop the strength required.

b) Test Cylinders: Make at least one (1) test of each day's pouring of each one hundred (100) cu. yards, whichever comes first, for each type of concrete (1 per building. minimum for foundations; 1 per building. minimum for pea gravel hardrock), on each different portion or section of the work. Mold and cure specimens in accordance with ASTM C31, and test in accordance with ASTM C39. Test cylinders shall be made and tested by the laboratory in accordance with ASTM C 172. Footings, walls, and floor systems constitute different sections. Each test shall consist of four (4) specimens, one (1) of which shall be broken at seven (7) days, two (2) at twenty-eight (28) days and one held in reserve. Determine temperature and air content for each set of test cylinders in accordance with ASTM C231.

c) Field Quality Control

(1)Determine slump for each strength test and whenever consistency of concrete appears to vary, in accordance with ASTM C143.

(2) Monitor addition of water to concrete and length of time concrete is allowed to remain in truck.

(3) Notate and verify delivery tickets indicating class of concrete, time test was performed, truck ticket number, amount of water added during initial batching, time initial batching occurred, and location of each placement.

(4) Monitor work being performed in accordance with ACI (American Concrete Institute) recommendations as a standard of quality.

(5) Notify job superintendent of any non-conformance immediately and note on daily job report including how resolved.

**END OF SECTION 01 45 23 - TESTING & INSPECTING SERVICES**

**SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS**

**PART 1: GENERAL**

1. RELATED DOCUMENTS
   a) Provisions established within the General and Supplementary General Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.

2.SECTION INCLUDES
   a) Electricity, Lighting.
   b) Heat, Ventilation.
   c) Telephone Service.
   d) Water.
   e) Sanitary Facilities.
   f) Fire Protection.
   g) Barriers.
   h) Enclosures.
   i) Protection of Installed Work.
   j) Security.
   k) Water Control.
   l) Cleaning During Construction.
   m) Project Identification.
   n) Field Offices and Sheds.
   o) Access Roads and Temporary Parking.
   p) Scaffolding.
   q) Sedimentation and erosion control.

3. TEMPORARY ELECTRICITY
   a) Provide and pay for power service required from Utility source.
   b) Provide power outlets for construction operations. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting, and as required by authorities having jurisdiction, and in accordance with all grounding requirements.

4. TEMPORARY LIGHTING
   a) Provide and maintain appropriate incandescent lighting for construction operations and as required by authorities having jurisdiction.
   b) Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails and lamps as required.
   c) Maintain lighting and provide routine repairs.
   d) Permanent building lighting may be utilized during construction.

5. TEMPORARY HEAT
   a) Provide and pay for heat devices and heat as required to maintain specified conditions for construction operations.
   b) Use of permanent heating/cooling systems for temporary heating/cooling shall not affect the warranty period.
   c) Prior to operation of permanent equipment for temporary heating purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.
   d) Maintain appropriate ambient temperature in areas where construction is in progress, unless indicated otherwise in specifications.
   e) Fuel oil heaters of any kind are not permitted.

6. TEMPORARY VENTILATION
   a) Ventilate enclosed areas to assure cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

7. TEMPORARY TELEPHONE SERVICE
   a) Provide adequate, separate telephone service lines to field office for voice and data.

8. TEMPORARY WATER SERVICE
   a) Provide service required for construction operations. Extend branch piping with outlets

located so that water is available by use of hoses.

b) All water shall be potable unless clearly marked otherwise.

9. TEMPORARY SANITARY FACILITIES

a) Provide and maintain required facilities and enclosures.

(1) Use of permanent new facilities by construction personnel is prohibited.

10. TEMPORARY FIRE PROTECTION

a) Observe and enforce throughout the Work all requirements of City, State and Insurance authorities to minimize fire hazards.

b) Remove combustible refuse from within each building daily.

c) Provide fire extinguishers required by the local fire department, city ordinances, and OSHA.

11. BARRIERS

a) Provide as required to prevent public entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.

b) Provide 6-foot high chain link fence around construction site and temporary construction staging area; equip with vehicular and pedestrian gates with locks on outside. Do not damage existing asphalt or paving. Contractor must confirm extent of fencing with Owner's Representative prior to mobilization

c) Provide barricades and covered walkways as required by governing authorities for public rights-of-way and for public access to existing buildings.

12. ENCLOSURES

a) Provide temporary weather-tight closures of openings in exterior surfaces to provide acceptable working conditions and protection for materials, to allow for temporary heating, and to prevent entry of unauthorized persons. Provide doors with self-closing hardware and locks.

13. PROTECTION OF INSTALLED WORK

a) Provide temporary protection for installed products. Control traffic in immediate area to minimize damage.

b) Provide protective coverings at walls, projections, jambs, sills, and soffits of openings. Protect finished floors and stairs from traffic, movement of heavy objects, and storage.

c) Prohibit traffic & storage on waterproofed & roofed surfaces, on lawn and landscaped areas.

14. PARKING

a) Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.

b) Coordinate access and haul routes with governing authorities and Owner.

c) Provide and maintain access to fire hydrants, free of obstructions.

d) Provide means of removing mud from vehicle wheels before entering streets.

e) Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

15. WATER CONTROL

a) Grade site to drain. Maintain excavations free of water. Provide and operate pumping equipment.

b) Protect site from puddling or running water.

16. CLEANING DURING CONSTRUCTION

a) Refer to Section 01 74 00 - Cleaning Up.

17. PROJECT IDENTIFICATION

a) Provide project identification sign.

b) Erect on site at location indicated.

c) No other signs are allowed without Owner permission except those required by law.

18. FIELD OFFICES AND SHEDS

a) Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and

equipped with sturdy furniture and drawing display table.

b) Provide space for Project meetings, with table and chairs to accommodate 6 persons.

c) Provide and pay for temporary utilities and connections to Field Office to support the functions noted above.

d) Storage Container for Tools, Materials, and Equipment: Weather-tight, with heat and ventilation for Products requiring controlled conditions, with adequate space for organized storage and access, and lighting for inspection of stored materials.

19. SCAFFOLDING

a) Type: Designed and installed by each contractor or subcontractor for his own use for work during construction. Conform to special requirements of respective trades that use scaffolding and applicable rules and regulations of local building codes and governing agencies, including OSHA's fall protection program.

b) Erect scaffolding independent of building walls: Arrange to avoid interference with other trades as much as possible.

c) Remove scaffolding when no longer required.

20. SEDIMENTATION AND EROSION CONTROL

a) Provide adequate silt fencing and/or hay bails as erosion control material per design build SWWPP. Extent of fencing shall be as indicated on plans or as necessary to prevent onsite and offsite erosion and sedimentation.

21. REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

a) Remove temporary materials, equipment, services, and construction prior to Completion inspection.

b) Clean and repair damage caused by installation or use of temporary facilities. Remove underground installations to a depth of 2-feet; grade site as indicated. Restore existing facilities used during construction to specified, or to original, condition.

22. OSHA

a) Workers shall wear protective clothing and other apparatus as appropriate to the work being performed, as required by OSHA and other laws and ordinances.

**PART 3 EXECUTION**

1. GENERAL

a) Comply with applicable requirements specified in Division 15 - Mechanical and in Division 16 - Electrical.

b) Maintain and operate systems to assure continuous service.

c) Modify and extend systems as work progress requires.

**END OF SECTION 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS**

# SECTION 01 6000 - PRODUCT REQUIREMENTS

## PART 1 GENERAL

Requirements of this section are general in nature. Refer to individual specification sections for additional, specific requirements.

### 1.01 SECTION INCLUDES

A. General product requirements.

B. Sustainable design-related product requirements.

C. Re-use of existing products.

D. Transportation, handling, storage and protection.

E. Product option requirements.

F. Substitution limitations and procedures.

G. Maintenance materials, including extra materials, spare parts, tools, and software.

### 1.02 RELATED REQUIREMENTS

A. Document 00 4325 - Substitution Request Form

B. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.

### 1.03 REFERENCE STANDARDS

A. 16 CFR 260.13 - Guides for the Use of Environmental Marketing Claims; Federal Trade Commission; Recycled Content; current edition.

B. C2C (DIR) - C2C Certified Products Registry; Cradle to Cradle Products Innovation Institute; http://www.c2ccertified.org/products/registry.

C. EN 15804 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products; 2012.

D. GreenScreen (LIST) - GreenScreen for Safer Chemicals List Translator; Clean Production Action; www.greenscreenchemicals.org.

E. GreenScreen (METH) - GreenScreen for Safer Chemicals Method v1.2; Clean Production Action; www.greenscreenchemicals.org.

F. ISO 14025 - Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures; 2006.

G. ISO 14040 - Environmental management -- Life cycle assessment -- Principles and framework; 2006.

H. ISO 14044 - Environmental management -- Life cycle assessment -- Requirements and guidelines; 2006.

I. ISO 21930 - Sustainability in building construction -- Environmental declaration of building products; 2007.

### 1.04 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

### 1.05 QUALITY ASSURANCE

A. Cradle-to-Cradle Certified: End use product certified Cradle-to-Cradle v2 Basic or Cradle-to-Cradle v3 Bronze, minimum.

B. Environmental Product Declaration (EPD): Publicly available, critically reviewed life cycle analysis having at least a cradle-to-gate scope.

1. Good: Product-specific; compliant with ISO 14044.
2. Better: Industry-wide, generic; compliant with ISO 21930, or with ISO 14044, ISO 14040, ISO 14025, and EN 15804; Type III third-party certification with external verification, in which the manufacturer is recognized as the program operator.
3. Best: Commercial-product-specific; compliant with ISO 21930, or with ISO 14044, ISO 14040, ISO 14025, and EN 15804; Type III third-party certification with external verification, in which the manufacturer is recognized as the program operator.
4. Where demonstration of impact reduction below industry average is required, submit both industry-wide and commercial-product-specific declarations; or submit at least 5 declarations for products of the same type by other manufacturers in the same industry.

C. GreenScreen Chemical Hazard Analysis: All ingredients of 100 parts-per-million or greater evaluated using GreenScreen for Safer Chemicals Method v1.2.
1. Good: GreenScreen List Translator evaluation to identify Benchmark 1 hazards; a Health Product Declaration includes this information.
2. Better: GreenScreen Full Assessment.
3. Best: GreenScreen Full Assessment by GreenScreen Licensed Profiler.
4. Acceptable Evidence: GreenScreen report.

D. Recycled Content: Determine percentage of post-consumer and post-industrial (pre-consumer) content separately, using the guidelines contained in 16 CFR 260.13.
1. Previously used, reused, refurbished, and salvaged products are not considered recycled.
2. Wood fabricated from timber abandoned in transit to original mill is considered reused, not recycled.
3. Determine percentage of recycled content of any item by dividing the weight of recycled content in the item by the total weight of all material in the item.
4. Determine value of recycled content of each item separately, by multiplying the content percentage by the value of the item.
5. Acceptable Evidence:
   a. For percentage of recycled content, information from manufacturer. b. For cost, Contractor's cost data.

E. Source Location: Location of harvest, extraction, recovery, or manufacture; where information about source location is required to be submitted, give the postal address:
1. In all cases, indicate the location of final assembly.
2. For harvested products, indicate location of harvest.
3. For extracted (i.e. mined) products, indicate location of extraction.
4. For recovered products, indicate location of recovery.
5. For products involving multiple manufacturing steps, provide a description of the process at each step, with location.
6. Acceptable Evidence:
   a. Manufacturer's certification.
   b. Life cycle analysis (LCA) performed by third-party.

F. Sustainably Harvested Wood: Solid wood, wood chips, and wood fiber certified or labeled by an organization accredited by one of the following:
1. The Forest Stewardship Council, The Principles for Natural Forest Management; for Canada visit http://www.fsccanada.org, for the USA visit http://www.fscus.org.
2. Acceptable Evidence: Copies of invoices bearing the certifying organization's certification numbers.

## PART 2 PRODUCTS

### 2.01 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.

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

C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

### 2.02 NEW PRODUCTS

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

B. DO NOT USE products having any of the following characteristics:
1. Made using or containing CFC's or HCFC's.

2. Made of wood from newly cut old growth timber.
3. Containing lead, cadmium, asbestos.

C. Where all other criteria are met, Contractor shall give preference to products that:
1. If used on interior, have lower emissions, as defined in Section 01 6116.
2. If wet-applied, have lower VOC content, as defined in Section 01 6116.
3. Are extracted, harvested, and/or manufactured closer to the location of the project.
4. Have longer documented life span under normal use.
5. Result in less construction waste.
6. Are made of recycled materials.
7. If made of wood, are made of sustainably harvested wood, wood chips, or wood fiber.
8. Are Cradle-to-Cradle Certified.
9. Have a published GreenScreen Chemical Hazard Analysis.

**2.03 PRODUCT OPTIONS**

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

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

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

**2.04 MAINTENANCE MATERIALS**

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

**PART 3 EXECUTION**

**3.01 SUBSTITUTION PROCEDURES**

A. Submit substitution requests by completing the form in Section 00 4325; see this section for additional information and instructions. Use only this form; other forms of submission are unacceptable.

B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

C. A request for substitution constitutes a representation that the submitter:
1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
2. Agrees to provide the same warranty for the substitution as for the specified product.
3. Agrees to coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension that may subsequently become apparent.

D. Substitution Submittal Procedure (after contract award):
1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
3. The Architect will notify Contractor in writing of decision to accept or reject request.

**3.02 TRANSPORTATION AND HANDLING**

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

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

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

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

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

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

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

**3.03 STORAGE AND PROTECTION**

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

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

C. Store with seals and labels intact and legible.

D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

G. Comply with manufacturer's warranty conditions, if any.

H. Do not store products directly on the ground.

I. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

J. Prevent contact with material that may cause corrosion, discoloration, or staining.

K. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

L. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

**END OF SECTION**

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

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

A. Requirements for Indoor-Emissions-Restricted products. B.

Requirements for VOC-Content-Restricted products.

#### 1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Submittal procedures.

#### 1.03 DEFINITIONS

A. Indoor-Emissions-Restricted Products: All products in the following product categories, whether specified or not:
   1. Interior paints and coatings.
   2. Interior adhesives and sealants, including flooring adhesives.
   3. Flooring.
   4. Composite wood.
   5. Products making up wall and ceiling assemblies.
   6. Thermal and acoustical insulation.

B. VOC-Content-Restricted Products: All products in the following product categories, whether specified or not:
   1. Interior paints and coatings.
   2. Interior adhesives and sealants, including flooring adhesives. C.

Interior of Building: Anywhere inside the exterior weather barrier.

D. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.

E. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

F. Inherently Non-Emitting Materials: Products composed wholly of minerals or metals, unless they include organic-based surface coatings, binders, or sealants; and specifically the following:
   1. Concrete.
   2. Clay brick.
   3. Metals that are plated, anodized, or powder-coated.
   4. Glass.
   5. Ceramics.
   6. Solid wood flooring that is unfinished and untreated.

#### 1.04 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; current edition.

B. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings; 2005 (Reapproved 2013).

C. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers; California Department of Public Health; v1.1, 2010.

D. CARB (ATCM) - Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products; California Air Resources Board; current edition.

E. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board; 2007.

F. CHPS (HPPD) - High Performance Products Database; Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.

G. CRI (GLP) - Green Label Plus Testing Program - Certified Products; Carpet and Rug Institute; Current Edition.

H. SCAQMD 1113 - South Coast Air Quality Management District Rule No.1113; current edition; www.aqmd.gov.

I. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

J. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at

www.scscertified.com.

K. UL (GGG) - GREENGUARD Gold Certified Products; UL Environment; current listings at http://http://productguide.ulenvironment.com/QuickSearch.aspx.

**1.05 SUBMITTALS**

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: For each VOC-restricted product used in the project, submit evidence of compliance.

**1.06 QUALITY ASSURANCE**

A. Indoor Emissions Standard and Test Method: CAL (CDPH SM), using Standard Private Office exposure scenario and the allowable concentrations specified in the method, and range of total VOC's after 14 days.
   1. Wet-Applied Products: State amount applied in mass per surface area.
   2. Paints and Coatings: Test tinted products, not just tinting bases.
   3. Evidence of Compliance: Acceptable types of evidence are the following;
      a. Current UL (GGG) certification.
      b. Current SCS (CPD) Floorscore certification.
      c. Current SCS (CPD) Indoor Advantage Gold certification.
      d. Current listing in CHPS (HPPD) as a low-emitting product. e. Current CRI (GLP) certification.
      f. Test report showing compliance and stating exposure scenario used.
   4. Product data submittal showing VOC content is NOT acceptable evidence.
   5. Manufacturer's certification without test report by independent agency is NOT acceptable evidence.

B. VOC Content Test Method: 40 CFR 59, Subpart D (EPA Method 24), or ASTM D3960, unless otherwise indicated.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Report of laboratory testing performed in accordance with requirements.

C. Composite Wood Emissions Standard: CARB (ATCM) for ultra-low emitting formaldehyde (ULEF) resins.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Current SCS "No Added Formaldehyde (NAF)" certification; www.scscertified.com. b. Report of laboratory testing performed in accordance with requirements.
      c. Published product data showing compliance with requirements.

D. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

**PART 2 PRODUCTS**

**2.01 MATERIALS**

A. Indoor-Emissions-Restricted Products: Comply with Indoor Emissions Standard and Test Method, except for:
   1. Composite Wood, Wood Fiber, and Wood Chip Products: Comply with Composite Wood Emissions Standard or contain no added formaldehyde resins.
   2. Inherently Non-Emitting Materials.

B. VOC-Content-Restricted Products: VOC content not greater than required by the following:
   1. Adhesives, Including Flooring Adhesives: SCAQMD 1168 Rule.
   2. Joint Sealants: SCAQMD 1168 Rule.
   3. Paints and Coatings: Each color; most stringent of the following:
      a. 40 CFR 59, Subpart D.
      b. SCAQMD 1113 Rule.
      c. CARB (SCM).

**PART 3 EXECUTION**

**3.01 FIELD QUALITY CONTROL**

A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.

B. Additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

**END OF SECTION**

## SECTION 01 7000 - EXECUTION AND CLOSEOUT REQUIREMENTS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.

C. Cutting and patching.

D. Surveying for laying out the work. E.

Cleaning and protection.

F. Starting of systems and equipment.

G. Demonstration and instruction of Owner personnel.

H. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

#### 1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.

B. Section 07 8400 - Firestopping.

#### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1. On request, submit documentation verifying accuracy of survey work.
   2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents.
   3. Submit surveys and survey logs for the project record.

C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight exposed elements.
   5. Work of Owner or separate Contractor.

#### 1.04 QUALIFICATIONS

A. For survey 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.

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.

#### 1.05 PROJECT CONDITIONS

A. Use of explosives is not permitted.

B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

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

E. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
   1. Minimize amount of bare soil exposed at one time.

2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
3. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

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

G. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

H. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

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

**1.06 COORDINATION**

A. See Section 01 1000 for occupancy-related requirements.

B. 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.

C. Notify affected utility companies and comply with their requirements.

D. 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.

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

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

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

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

**PART 2 PRODUCTS**

**2.01 PATCHING MATERIALS**

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

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

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000 - Product Requirements.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

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

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

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

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

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

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to

damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

**3.02 PREPARATION**

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

**3.03 LAYING OUT THE WORK**

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

Promptly notify Architect of any discrepancies discovered.

C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.

F. Utilize recognized engineering survey practices.

G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:

1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations; and _____.
2. Grid or axis for structures.
3. Building foundation, column locations, ground floor elevations, and _____. H.

Periodically verify layouts by same means.

I. Maintain a complete and accurate log of control and survey work as it progresses.

**3.04 GENERAL INSTALLATION REQUIREMENTS**

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

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

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated. E. Make neat transitions between different surfaces, maintaining texture and appearance.

**3.05 ALTERATIONS**

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.

1. Verify that construction and utility arrangements are as shown.
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 items indicated on drawings.
2. Relocate items indicated on drawings.
3. 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.
4. 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, Electrical,

Telecommunications, and _____): Remove, relocate, and extend existing systems to accommodate new construction.

1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
   b. Provide temporary connections as required to maintain existing systems in service.
4. Verify that abandoned services serve only abandoned facilities.
5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

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.
   2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
   3. Where a change of plane of 1/4 inch (6 mm) or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.
   4. Trim existing wood doors as necessary to clear new floor finish. Refinish trim as required.

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.

**3.06 CUTTING AND PATCHING**

A. Whenever possible, execute the work by methods that avoid cutting or patching. B. See Alterations article above for additional requirements.

C. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-conforming work.

D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

G. Restore work with new products in accordance with requirements of Contract Documents. H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400, to full thickness of the penetrated element.

J. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

**3.07 PROGRESS CLEANING**

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

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

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

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

**3.08 PROTECTION OF INSTALLED WORK**

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

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

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

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

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

**3.09 SYSTEM STARTUP**

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

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

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

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

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

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

**3.10 DEMONSTRATION AND INSTRUCTION**

A. Demonstrate 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 personnel.

E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

### 3.11 ADJUSTING

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

### 3.12 FINAL CLEANING

A. Use cleaning materials that are nonhazardous.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

E. Clean filters of operating equipment.

F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, drainage systems, and _____.

G. Clean site; sweep paved areas, rake clean landscaped surfaces.

H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

### 3.13 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

E. Owner will occupy all of the building as specified in Section 01 1000.

F. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

G. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

H. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.

I. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

**END OF SECTION**

# SECTION 01 73 29 - CUTTING AND PATCHING

**PART 1: GENERAL**

1. RELATED DOCUMENTS
   a) Provisions established within the General and Supplemental General Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.
2. SECTION INCLUDES
   a) Requirements and limitations for cutting and patching of Work.
3. SUBMITTALS
   a) Submit written request in advance of cutting or alteration which affects:
   b) Structural integrity of any element of the Project.
4. PAYMENT FOR COSTS
   a) Costs resulting from ill-timed or defective work, or work not conforming to Contract Documents, including costs for additional services of Architect, or other consultants shall be borne by the partly responsible for ill-timed, rejected or non-conforming Work.

**PART 2: PRODUCTS**

1. MATERIALS
   a) Products: Those required for original installation.
   b) For any change in materials, submit request for substitution under provisions of Section 01 25 00 - Product Options & Substitutions.

**PART 3: EXECUTION**

1. GENERAL
   a) Execute cutting, fitting, and patching including excavation and fill, to complete Work, and to:
      (1) Fit the several parts together, to integrate with other work.
      (2) Uncover work to install ill-timed work.
      (3) Remove and replace defective and non-conforming work.
      (4) Remove samples of installed work for testing.
      (5) Provide openings in elements of Work for penetrations of mechanical and electrical work.
2. INSPECTION
   a) Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
   b) After uncovering, inspect conditions affecting performance of work.
   c) Beginning of cutting or patching means acceptance of existing conditions.
3. PREPARATION
   a) Provide temporary supports to assure structural integrity of surroundings; devices and methods to protect other portions of Project from damage.
   b) Provide protection from elements for areas which may be exposed by uncovering work.
4. PERFORMANCE
   a) Execute work by methods to avoid damage to other work, and which will provide proper surfaces to receive patching and finishing.
   b) Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
   c) Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
   d) Restore work with new products in accordance with requirements of Contract Documents.
   e) Fit work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
   f) At penetrations of fire-rated wall, ceiling, or floor construction, completely seal voids with fire-rated packing material, full thickness of the construction element.
   g)
   Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

**END OF SECTION 01 73 29 - CUTTING AND PATCHING**

## SECTION 01 74 00 - CLEANING UP

### PART 1: GENERAL

1. RELATED DOCUMENTS
   a) Provisions established within the General and Supplementary General Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.

2. SECTION INCLUDES
   a) Clean up during construction.
   b) Subcontractor clean-up.
   c) Final clean-up.

3. SAFETY REQUIREMENTS
   a) Store volatile and toxic waste in covered metal containers. Remove from Project site daily. Provide adequate ventilation during use of volatile or toxic substances.
   b) Prohibited practices
      (1) Allowing volatile or toxic wastes to accumulate on Project site.
      (2) Burning or burying of waste materials or rubbish on Project site.
      (3) Disposal of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains, on pavements, in gutters or downspout, or on Project site.
      (4) Disposal of waste or cleaning materials which contain materials harmful to plant growth on Project site.
   c) Clean up accidentally spilled materials as quickly as possible in accordance with Governing regulations.

4. CLEAN-UP DURING CONSTRUCTION
   a) Execute cleaning procedures to ensure that building, Project site, and adjacent properties are maintained free from debris and rubbish.
   b) Wet down materials subject to blowing. Throwing waste materials from heights is prohibited.
   c) Provide on-site containers for waste collection. Place all waste materials and rubbish in containers daily to prevent accumulation. Remove waste from Project site when containers become full.
   d) Legally dispose of all waste materials, rubbish, volatile materials, and cleaning materials off Project site.
   e) Clean and maintain interior spaces prior to start of finish painting in a "broom clean" state until Date of Completion. Protect newly finished and clean surfaces from contamination during cleaning operations.
   f) Accumulation of debris contributing to survival or spread of rodents, roaches, or other pests is prohibited.
      (1) Remove debris containing food scraps on a daily basis.
      (2) Contractor shall be responsible for securing services of a pest exterminator at no additional cost to the Owner, if required by site conditions during construction.
   g) Disposal of materials in waterways is prohibited.
   h) Graffiti or other similar distasteful comments or illustrations authored on any building materials used on Project is prohibited. Monitor Project for violations of this criteria, and, if found, take appropriate action immediately to cover or replace defaced materials as necessary.

5. SUBCONTRACTOR CLEAN-UP
   a) Each subcontractor on Project Site is required to conform to particular requirements of this complete Section 01 74 00 - Cleaning Up.
   b) Each individual subcontractor is required to maintain Project site, individual buildings, and units within buildings clean and neat regarding Work included under their separate contracts with Contractor.
   c) If subcontractor fails to keep Project clean or to clean up waste material resulting from Work under his Contract at times scheduled, Contractor may clean up and apportion costs to responsible subcontractors after 24 hour written notice.

6. FINAL CLEAN-UP
   a )In addition to removal of debris and cleaning specified in other section, clean interior and exterior exposed to view surfaces.
   b) Remove temporary protection and labels not required to remain.
   c) Clean finishes free of dust, stains, films and other foreign substances.

d) Clean transparent and glossy materials to a polished condition; remove foreign substances.
e) Vacuum clean carpet and similar soft surfaces.
f) Clean, damp mop, wax, and polish resilient and hard surface floor as specified.
g) Clean surfaces of equipment; remove excess lubrication.
h) Clean plumbing fixtures, and food service equipment, to a sanitary condition.
i) Clean permanent filters of ventilating equipment and replace disposable filters when units have been operated during construction; in addition, clean ducts, blowers, and coils when units have been operated without filters during construction.
j) Clean light fixtures and lamps.
k) Maintain cleaning until Final Completion.
l) Remove waster, foreign matter, and debris from roofs, and drainage systems. m) Remove waste, debris, and surplus materials from site. Clean grounds; remove stains, spills and foreign substances from paved areas and sweep clean. Rake clean other exterior surfaces.

**END OF SECTION 01 74 00 - CLEANING UP**

## SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

### GENERAL

### 1. 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. Owner may decide to pay for additional recycling, salvage, and/or reuse based on Landfill Alternatives Proposal specified below.

E. 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: May be used as blocking or furring.
5. Concrete.
6. Concrete masonry units.
7. Asphalt paving.
8. 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.
9. Glass.
10. Gypsum drywall and plaster.
11. Plastic buckets.
12. Paint.
13. Plumbing fixtures.
14. Mechanical and electrical equipment.

F. 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.

G. Contractor shall develop and follow a Waste Management Plan designed to implement these requirements.

H. The following sources may be useful in developing the Waste Management Plan: I.

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.
5. Incineration, either on- or off-site.

J. 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.

### 2. RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. Section 01 5000 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

C. Section 01 6000 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.

D. Section 01 7000 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

**3. 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.

**4. SUBMITTALS**

A. See Section 01 3000 - 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. Submit to Architect for Owner's review and approval.
2. Include an analysis of trash/waste to be generated and landfill options as specified for Waste Management Plan described below.
3. Describe as many alternatives to landfilling as possible:
   a. List each material proposed to be salvaged, reused, or recycled.
   b. List the proposed local market for each material.
   c. State the estimated net cost resulting from each alternative, after subtracting revenue from sale of recycled or salvaged materials and landfill tipping fees saved due to diversion of materials from the landfill.
4. Provide alternatives to landfilling for at least the following materials:
   a. Land clearing debris, including brush, branches, logs, and stumps. b. Bricks.

D. Waste Management Plan: Include the following information:

1. Analysis of the trash and waste projected to be generated during the entire project construction cycle, including types and quantities.
2. Landfill Options: The name, address, and telephone number of the landfill(s) where trash/waste will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all project trash/waste in the landfill(s).
3. Landfill Alternatives: List all waste materials that will be diverted from landfills by reuse, salvage, or recycling.
4. Meetings: Describe regular meetings to be held to address waste prevention, reduction,

recycling, salvage, reuse, and disposal.

5. Materials Handling Procedures: Describe the means by which materials to be diverted from landfills will be protected from contamination and prepared for acceptance by designated facilities; include separation procedures for recyclables, storage, and packaging.
6. Transportation: Identify the destination and means of transportation of materials to be recycled; i.e. whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler.

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

## PART 3 EXECUTION

### 1. WASTE MANAGEMENT PROCEDURES

A. See Section 01 3000 for additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. See Section 01 5000 for additional requirements related to trash/waste collection and removal facilities and services.

C. See Section 01 6000 for waste prevention requirements related to delivery, storage, and handling.

D. See Section 01 7000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

### 2. WASTE MANAGEMENT PLAN IMPLEMENTATION

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

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings.
1. Pre-bid meeting.
2. Pre-construction meeting.
3. Regular job-site meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
   1. Provide containers as required.
   2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
   3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

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

G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

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

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

**END OF SECTION**

## SECTION 01 78 00 - CLOSEOUT SUBMITTALS

### PART 1: GENERAL

#### 1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

#### 1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

B. Individual Product Sections: Specific requirements for operation and maintenance data. C. Individual Product Sections: Warranties required for specific products or Work.

#### 1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.

B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
   4. Submit two sets of revised final documents 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 3 EXECUTION

#### 3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Addenda.
   3. Change Orders and other modifications to the Contract.

B. Ensure entries are complete and accurate, enabling future reference by Owner. C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Record Drawings : Legibly mark each item to record actual construction including:
   1. Field changes of dimension and detail.
   2. Details not on original Contract drawings.

#### 3.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

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

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

#### 3.03 OPERATION AND MAINTENANCE DATA FOR 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. Additional Requirements: As specified in individual product specification sections.

**3.04 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 (216 by 280 mm) three D side ring binders with durable plastic covers; 2 inch (50 mm) 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 20 pound paper.

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

J. Digital Copies: Provide two digital pdf file copies of the Operations and Maintenance Manual on DVD media for the Owner and the Architect.

**3.05 WARRANTIES AND BONDS**

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

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

C. Co-execute submittals when required.

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

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

**END OF SECTION**

## SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

### PART 1: GENERAL

1.RELATED DOCUMENTS

a) Provisions established within the General and Supplemental General Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.

2. SECTION INCLUDES

a) Format and content of manuals.
b) Instruction of Owner's personnel.

3. QUALITY ASSURANCE

a) Prepared instructions and data by personnel experienced in maintenance and operation of described products.

4. FORMAT

a) Prepare data in the form of an instructional manual..
b) Binders: Commercial quality, 8-1/2 x 11-inch three-ring binders with hardback, cleanable, plastic covers; 3-inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
c) Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; title of Project and subject matter of contents.
d) Arrange content by systems, under section numbers and sequence of Table of Contents of this Project Manual.
e) Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
f) Text: Manufacturer's printed data, or typewritten data on 20-pound paper.
g) Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

5. CONTENTS

a) Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect/Engineer and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.
b) For Each Product or System: List names, addresses, and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
c) Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.
d) 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 Document as maintenance drawings.
e) Typed Text: As required to supplement product date. Provide logical sequence of instructions for each procedures, incorporating manufacturer's instructions specified in Section 01 45 00 - Contract Quality Control.
f) Warranties and Bonds: Bind in copy of each.

6. MANUAL FOR MATERIALS AND FINISHES

a) Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Provide information for re-ordering custom manufactured products.
b) Instruction for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
c) Moisture-protection and Weather-exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
d) Additional Requirements: As specified in individual Specifications sections.
e) Provide a listing of Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

7. MANUAL FOR EQUIPMENT AND SYSTEMS

a) Each Item of Equipment and Each System: Include description of unit or system, and component parts, and number of replaceable parts.
b) Panelboard Circuit Directories: Provide electrical service characteristics, controls and communications.

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 instruction, all as included in manufacturer's literature.
d) Maintenance Requirements: Include routine procedures and guide for 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 as-installed control diagrams by controls manufacturer.
j) Provide charts of valve, with location and function of each valve.
k) Additional Requirements: As specified in individual Specifications sections.
l) Provide serial numbers for all appliances and HVAC equipment.

8. Instruction of owner personnel
a) Before final inspection, instruct Owner's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times. For equipment requiring seasonal operation, perform instructions for other seasons within six months.
b) Use operation and maintenance manuals as basis of instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
c) Prepare and insert additional data in Operation and Maintenance Manual when need for such data become apparent during instruction.

9. Submittals
a) Submit two (2) copies of preliminary draft or proposed formats and outlines of contents before start of Work. Owner's Representative will review draft and return one (1) copy with comments.
b) Submit one (1) copy of completed volumes in final form 15-days prior to final inspection. Copy will be returned after final inspection, with Owner's Representative's comments. Revise content of documents as required prior to final submittal.
c) Submit two (2) copies of revised volumes of data in final form within 10-days after final inspection.

**END OF SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA**

# SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

## PART 1: GENERAL

1. RELATED DOCUMENTS
   a) Provisions established within the General and Supplementary General Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.

2. SECTION INCLUDES
   a) Maintenance of Record Documents and Samples.
   b) Submittal of Record Documents and Samples.
   c) Submittal of Product Data and Contact List.

3. MAINTENANCE OF DOCUMENTS AND SAMPLES
   a) In addition to requirements in General Conditions, maintain at the site one (1) record copy of:
      (1) Contract Drawings and plan schedule.
      (2) Specifications.
      (3) Addenda.
      (4) Change Orders and other modifications of the Contract.
      (5) Reviewed Submittals.
      (6) Field test records.
      (7) Inspection certificates.
      (8) Manufacturer's certificates.
      (9) RFI & logs.
      (10) SK drawings and logs.
   b) Store Record Documents and samples in Field Office apart from documents used for construction. Provide files, racks, and secure storage for Record Documents and samples.
   c) Label and file Record Documents and samples in accordance with section number listings in Table of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
   d) Maintain Record Documents in a clean, dry and legible condition. Do not use Record Documents for construction purposes.
   e) Keep Record Documents and samples available for inspection by Owner's Representative and Inspecting Consultant.

4. RECORDING
   a) Record information on a set of blue line opaque drawings, and in a copy of a Project Manual. At completion of the project, transfer information from the blue line prints onto reverse reading mylar reproducibles.
   b) Provide felt tip marking pens, maintaining separate colors for each major system, for record information.
   c) Record information concurrently with construction progress. Do not conceal any work until required information is recorded.
   d) Contract Drawings and Shop Drawings: Legibly mark each item to record actual construction, including:
      (1) Measured horizontal locations for water, storm drainage, and sanitary sewer drainage piping and measured horizontal and vertical locations for all other underground utilities, referenced to permanent surface improvements.
      (2) Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.
      (3) Field changes of dimension and detail.
      (4) Changes made by Modifications, including all RFI's.
      (5) Details not on original Contract Drawings or SK Drawings.
      (6) References to related shop drawings and modifications.
   e) Other Documents: Maintain manufacturer's certifications, inspection certifications, field test records, and other documents required by individual specification sections.

5. SUBMITTALS
   a) At Contract closeout, deliver Record Documents and samples under provisions of Section 00 70 00 - Contract Closeout.
      (1) Transmit with cover letter in duplicate, listing:
         (a) Date.
         (b) Project title and number.

(c) Contractor's name, address, and telephone number.
(d) Number and title of each Record Document.
(e) Signature of Contractor or authorized representative.

b) Product Data and Contact List
(1) Preparation of Submittals
(a) Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect/Engineer and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.
(b )For Each Product or System: List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
(c) Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.
(d) 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 informational drawings.
(e) Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.
(f) Warranties and Bonds: Bind in copy of each. See Section 01 78 00 - Warranties and Bonds.
(2) Form of Submittals
(a) Prepare data in the form of an instructional manual.
(b) Binders: Commercial quality, 8-1/2 x 11-inch three-ring binders with hardback, cleanable, plastic covers; 3-inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
(c) Cover: Identify each binder with typed or printed title "Product DATA and Contact List"; list title of Project and identify subject matter of contents.
(d) Arrange content by systems, under section numbers and sequence of Table of Contents of this Project Manual.
(e) Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
(f) Text: Manufacturer's printed data, or typewritten data on 20-pound paper.
(g) Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
(3) Time of Submittals
(a) Submit two (2) copies of preliminary draft of proposed formats and outlines of contents within 60 days of Notice to Proceed. Owner's Representative will review draft and return one (1) copy with comments.
(b) Submit one (1) copy of completed volumes in final form 15-days prior to final inspection. Copy will be returned after final inspection, with Owner's Representative's comments. Revise content of documents as required prior to final submittal.
(c) Submit two (2) copies of revised volumes of data in final form within 10-days after final inspection.

## I. END OF SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

**SECTION 01 93 00 – FACILITY MAINTENANCE:**

**SPARE PARTS, OVERAGES AND MAINTENANCE MATERIALS**

**A. PART 1: GENERAL**

1. RELATED DOCUMENTS
   a) Provisions established within the General and Supplementary General Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.

2. REQUIREMENTS INCLUDED
   a) Products required.
   b) Storage and delivery of products.

3. Products required
   a) Provide quantities of products, spare parts, maintenance tools, and maintenance materials specified in individual section to be provided to Owner's Representative in addition to that required for completion of Work.
   b) Products: Indentical to those installed in the Work. Include quantities in original purchase from manufacturers to avoid variations in manufacture.

4. Storage, Maintenance
   a) Store products with products to be installed in the Work, under provisions of Section 01 66 00-Delivery, Storage and Handling.
   b) When adequate, secure storage facilities are available at site, capable of maintaining conditions required for storage and not required for Contract work or storage, or for Owner's needs, spare products may be stored in available space.
   c) Maintain spare products in original containers with labels intact and legible, until delivery to Owner.

5. Delivery
   a) Coordinate with Owner's Representative: Deliver and unload spare products to Owner at Project site and obtain receipt prior to final payment.
   b) For portions of Project accepted and occupied by Owner prior to Completion, deliver a proportional part of spare products to Owner's Representative; obtain receipt.

**END OF SECTION 01 93 00 – Facility Maintenance:**
**SPARE PARTS, OVERAGES AND MAINTENANCE MATERIALS**

**SECTION 02 41 19 - SELECTIVE STRUCTURE DEMOLITION**

**PART 1 - GENERAL**

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

2. SUMMARY
   A. Section Includes:
      1. Demolition and removal of selected portions of building or structure.
      2. Demolition and removal of selected site elements.
      3. Salvage of existing items to be reused or recycled. B.

      Related Requirements:

      1. Section 011000 "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
      2. Section 015639 "Temporary Tree and Plant Protection" for temporary protection of existing trees and plants that are affected by selective demolition.
      3. Section 017300 "Execution" for cutting and patching procedures.
      4. Section 311000 "Site Clearing" for site clearing and removal of above- and below-grade improvements.

3. DEFINITIONS
   A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
   B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.
   C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
   D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

4. MATERIALS OWNERSHIP
   A. Unless otherwise indicated, demolition waste becomes property of Contractor.
   B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
      1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

5. PREINSTALLATION MEETINGS
   A. Predemolition Conference: Conduct conference at Project site.
      1. Inspect and discuss condition of construction to be selectively demolished.
      2. Review structural load limitations of existing structure.
      3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
      4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
      5. Review areas where existing construction is to remain and requires protection.

6. INFORMATIONAL SUBMITTALS
   A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection and for dust control. Indicate proposed locations and construction of barriers.
   B. Schedule of Selective Demolition Activities: Indicate the following:
      1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
      2. Coordination for shutoff, capping, and continuation of utility services.

C. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.
D. Predemolition Photographs or Video: Submit before Work begins.
E. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.
F. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.

7. CLOSEOUT SUBMITTALS
A. Inventory: Submit a list of items that have been removed and salvaged.
B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

8. QUALITY ASSURANCE
A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

9. FIELD CONDITIONS
A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
B. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
C. Historic Areas: Demolition and hauling equipment and other materials shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, including temporary protection, by 12 inches (300 mm) or more.
D. Storage or sale of removed items or materials on-site is not permitted.
E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

**PART 2 - PRODUCTS**

1. PEFORMANCE REQUIREMENTS
A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 **PART 3 - EXECUTION**

1. EXAMINATION
A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
D. Survey of Existing Conditions: Record existing conditions by use of preconstruction videotapes.
1. Inventory and record the condition of items to be removed and salvaged. Provide video of conditions that might be misconstrued as damage caused by salvage operations.
2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

2. UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Arrange to shut off indicated utilities with utility companies.
2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Disconnect, demolish, and remove plumbing and HVAC systems, equipment, and components indicated to be removed.
   a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
   b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
   c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
   d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
   e. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
   f. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.

C. Refrigerant: Remove refrigerant from mechanical equipment to be selectively demolished according to 40 CFR 82 and regulations of authorities having jurisdiction.

3. PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Comply with requirements for access and protection specified in Section 015000 "Temporary Facilities and Controls."

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furnishings, and equipment that have not been removed.
5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

4. SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on

the next lower level.

2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 "Construction Waste Management and Disposal."

B. Removed and Salvaged Items:

1. Store items in a secure area until needed for renstallation.

C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

5. SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

B. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

C. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight. See Section 07 31 00 Asphalt flat roofing and shingle repair requirements.

1. Remove existing roof membrane, flashings, copings, and roof accessories.
2. Remove existing roofing system down to substrate.

6. DISPOSAL OF DEMOLISHED MATERIALS

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

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

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

7. CLEANING

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

**END OF SECTION 02 41 19 SELECTIVE STRUCTURE DEMOLITION**

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

### PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section specifies cast-in place concrete, including formwork, reinforcing, mix design, placement procedures, and finishes for the building.

B. Cast-in-place concrete includes the following:
1. Foundations and footings.
2. Slabs-on-grade.
3. Equipment pads and bases.

1.03 SUBMITTALS

A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.

B. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, dry-shake finish materials, and others if requested by Architect.

C. Shop drawings for reinforcement detailing fabricating, bending, and placing concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, bent bar diagrams, and arrangement of concrete reinforcement. Include special reinforcing required for openings through concrete structures.

D. Shop drawings for formwork indicating fabrication and erection of forms for specific finished concrete surfaces. Show form construction including jointing, special form joints or reveals, location and pattern of form tie placement, and other items that affect exposed concrete visually.
1. Architect's review is for general architectural applications and features only. Designing formwork for structural stability and efficiency is Contractor's responsibility.

E. Samples of materials as requested by Architect, including names, sources, and descriptions, as follows:
1. Reglets.
2. Vapor retarder/barrier.

F. Laboratory test reports for concrete materials and mix design test.

G. Material certificates in lieu of material laboratory test reports when permitted by Architect. Material certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with or exceeds specified requirements. Provide certification from admixture manufacturers that chloride content complies with specification requirements.

H. Minutes of preinstallation conference.

1.04 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified:
1. American Concrete Institute (ACI) 301, "Specifications for Structural Concrete for Buildings."
2. ACI 318, "Building Code Requirements for Reinforced Concrete."
3. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice."

B. Concrete Testing Service: Engage a testing agency acceptable to Architect to perform material evaluation tests and to design concrete mixes.

C. Materials and installed work may require testing and retesting at any time during progress of Work. Tests, including retesting of rejected materials for installed Work, shall be done at Contractor's expense.

D. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Coordination" and the following:
1. At least 35 days prior to submitting design mixes, conduct a meeting to review detailed requirements for preparing concrete design mixes and to determine procedures for satisfactory concrete operations. Review requirements for submittals, status of coordinating work, and availability of materials. Establish preliminary work progress schedule and procedures for materials inspection, testing, and certifications. Require representatives of each entity directly

concerned with cast-in-place concrete to attend conference, including, but not limited to, the following:
a. Contractor's superintendent.
b. Agency responsible for concrete design mixes.
c. Agency responsible for field quality control.
d. Ready-mix concrete producer.
e. Concrete subcontractor.
f. Primary admixture manufacturers.

## PART 2 PRODUCTS

2.01 FORM MATERIALS

A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings.

B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or another acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Form Release Agent: Provide commercial formulation form release agent with a maximum of 350 g/L volatile organic compounds (VOCs) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

D. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties designed to prevent form deflection and to prevent spalling of concrete upon removal. Provide units that will leave no metal closer than 1-1/2 inches to the plane of the exposed concrete surface.
1. Provide ties that, when removed, will leave holes not larger than 1 inch in diameter in the concrete surface.

2.02 REINFORCING MATERIALS

A. Reinforcing Bars: ASTM A 615 Grade, deformed.

B. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar-type supports complying with CRSI specifications.
1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
2. For exposed-to-view concrete surfaces where legs of supports are in contact with forms, provide supports with legs that are protected by plastic (CRSI, Class 1) or stainless steel (CRSI, Class 2).

2.03 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I.
1. Use one brand of cement throughout Project unless otherwise acceptable to Architect.

B. Fly Ash: ASTM C 618, Type F.

C. Normal-Weight Aggregates: ASTM C 33 and as specified. Provide aggregates from a single source for exposed concrete.
1. For exposed exterior surfaces, do not use fine or coarse aggregates that contain substances that cause spalling.
2. Local aggregates not complying with ASTM C 33 that have been shown to produce concrete of adequate strength and durability by special tests or actual service may be used when acceptable to Architect.

D. Water: Potable.

E. Admixtures, General: Provide concrete admixtures that contain not more than 0.1 percent chloride ions.

F. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
a. Air-Tite, Cormix Construction Chemicals.
b. Air-Mix or Perma-Air, Euclid Chemical Co.
c. Darex AEA or Daravair, W.R. Grace & Co.
d. MB-VR or Micro-Air, Master Builders, Inc.
e. Sealtight AEA, W.R. Meadows, Inc.
f. Sika AER, Sika Corp.

G. Water-Reducing Admixture: ASTM C 494, Type A.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
   a. Chemtard, ChemMasters Corp.
   b. PSI N, Cormix Construction Chemicals.
   c. Eucon WR-75, Euclid Chemical Co.
   d. WRDA, W.R. Grace & Co.
   e. Pozzolith Normal or Polyheed, Master Builders, Inc.
   f. Metco W.R., Metalcrete Industries.
   g. Prokrete-N, Prokrete Industries.
   h. Plastocrete 161, Sika Corp.

H. High-Range Water-Reducing Admixture: ASTM C 494, Type F or Type G.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
   a. Super P, Anti-Hydro Co., Inc.
   b. Cormix 200, Cormix Construction Chemicals.
   c. Eucon 37, Euclid Chemical Co.
   d. WRDA 19 or Daracem, W.R. Grace & Co.
   e. Rheobuild or Polyheed, Master Builders, Inc.
   f. Superslump, Metalcrete Industries.
   g. PSPL, Prokrete Industries.
   h. Sikament 300, Sika Corp.

I. Water-Reducing, Accelerating Admixture: ASTM C 494, Type E.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
   a. Q-Set, Conspec Marketing & Manufacturing Co.
   b. Lubricon NCA, Cormix Construction Chemicals.
   c. Accelguard 80, Euclid Chemical Co.
   d. Daraset, W.R. Grace & Co.
   e. Pozzutec 20, Master Builders, Inc.
   f. Accel-Set, Metalcrete Industries.

J. Water-Reducing, Retarding Admixture: ASTM C 494, Type D.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
   a. PSI-R Plus, Cormix Construction Chemicals.
   b. Eucon Retarder 75, Euclid Chemical Co.
   c. Daratard-17, W.R. Grace & Co.
   d. Pozzolith R, Master Builders, Inc.
   e. Protard, Prokrete Industries.
   f. Plastiment, Sika Corporation.

2.04 RELATED MATERIALS

A. Reglets: Where sheet flashing or bituminous membranes are terminated in reglets, provide reglets of not less than 0.0217- inch- thick galvanized sheet steel. Fill reglet or cover face opening to prevent intrusion of concrete or debris.

B. Dovetail Anchor Slots: Hot-dip galvanized sheet steel, not less than 0.0336 inch thick with bent tab anchors. Fill slot with temporary filler or cover face opening to prevent intrusion of concrete or debris.

C. Sand Cushion: Clean, manufactured or natural sand.

D. Vapor Retarder: Provide vapor retarder that is resistant to deterioration when tested according to ASTM E 154, as follows:
1. Polyethylene sheet not less than 6 mils thick.

E. Vapor Barrier: Premolded seven-ply membrane consisting of reinforced core and carrier sheet with fortified bitumen layers, protective weathercoating, and plastic antistick sheet. Water vapor transmission rate of 1 perm when tested according to ASTM E 96, Method B. Provide manufacturer's recommended mastics and gusset tape.
1. Product: Subject to compliance with requirements, provide Sealtight Premoulded Membrane by W.R. Meadows, Inc.

F. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd., complying with AASHTO M 182, Class 2.

G. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.
1. Waterproof paper.
2. Polyethylene film.
3. Polyethylene-coated burlap.

H. Liquid Membrane-Forming Curing Compound: Liquid-type membrane-forming curing compound complying with ASTM C 309, Type I, Class A. Moisture loss not more than 0.55 kg/sq. m when applied at 200 sq. ft./gal.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
   a. A-H 3 Way Sealer, Anti-Hydro Co., Inc.
   b. Spartan-Cote, The Burke Co.
   c. Conspec #1, Conspec Marketing & Mfg. Co.
   d. Sealco 309, Cormix Construction Chemicals.
   e. Day-Chem Cure and Seal, Dayton Superior Corp.
   f. Eucocure, Euclid Chemical Co.
   g. Horn Clear Seal, A.C. Horn, Inc.
   h. L&M Cure R, L&M Construction Chemicals, Inc.
   i. Masterkure, Master Builders, Inc.
   j. CS-309, W.R. Meadows, Inc.
   k. Seal N Kure, Metalcrete Industries.
   l. Kure-N-Seal, Sonneborn-Chemrex.
   m. Stontop CS2, Stonhard, Inc.

I. Water-Based Acrylic Membrane Curing Compound: ASTM C 309, Type I, Class B.
1. Provide material that has a maximum volatile organic compound (VOC) rating of 350 g/L.
2. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
   a. Highseal, Conspec Marketing and Mfg. Co.
   b. Sealco - VOC, Cormix Construction Chemicals.
   c. Safe Cure and Seal, Dayton Superior Corp.
   d. Aqua-Cure, Euclid Chemical Co.
   e. Dress & Seal WB, L&M Construction Chemicals, Inc.
   f. Masterkure 100W, Master Builders, Inc.
   g. Vocomp-20, W.R. Meadows, Inc.
   h. Metcure, Metalcrete Industries.
   i. Stontop CS1, Stonhard, Inc.

J. Evaporation Control: Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
   a. Aquafilm, Conspec Marketing and Mfg. Co.
   b. Eucobar, Euclid Chemical Co.
   c. E-Con, L&M Construction Chemicals, Inc.
   d. Confilm, Master Builders, Inc.
   e. Waterhold, Metalcrete Industries.

K. Bonding Agent: Polyvinyl acetate or acrylic base.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
   a. Polyvinyl Acetate (Interior Only):
      1) Superior Concrete Bonder, Dayton Superior Corp.
      2) Euco Weld, Euclid Chemical Co.
      3) Weld-Crete, Larsen Products Corp.
      4) Everweld, L&M Construction Chemicals, Inc.
      5) Herculox, Metalcrete Industries.
      6) Ready Bond, Symons Corp.
   b. Acrylic or Styrene Butadiene:
      1) Acrylic Bondcrete, The Burke Co.
      2) Strongbond, Conspec Marketing and Mfg. Co.
      3) Day-Chem Ad Bond, Dayton Superior Corp.
      4) SBR Latex, Euclid Chemical Co.
      5) Daraweld C, W.R. Grace & Co.
      6) Hornweld, A.C. Horn, Inc.
      7) Everbond, L&M Construction Chemicals, Inc.
      8) Acryl-Set, Master Builders Inc.
      9) Intralok, W.R. Meadows, Inc.
      10) Acrylpave, Metalcrete Industries.

11) \Sonocrete, Sonneborn-Chemrex.
12) Stonlock LB2, Stonhard, Inc.
13) Strong Bond, Symons Corp.

L. Epoxy Adhesive: ASTM C 881, two-component material suitable for use on dry or damp surfaces. Provide material type, grade, and class to suit Project requirements.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
a. Burke Epoxy M.V., The Burke Co.
b. Spec-Bond 100, Conspec Marketing and Mfg. Co.
c. Resi-Bond (J-58), Dayton Superior.
d. Euco Epoxy System #452 or #620, Euclid Chemical Co.
e. Epoxtite Binder 2390, A.C. Horn, Inc.
f. Epabond, L&M Construction Chemicals, Inc.
g. Concresive Standard Liquid, Master Builders, Inc.
h. Rezi-Weld 1000, W.R. Meadows, Inc.
i. Metco Hi-Mod Epoxy, Metalcrete Industries.
j. Sikadur 32 Hi-Mod, Sika Corp.
k. Stonset LV5, Stonhard, Inc.
l. R-600 Series, Symons Corp.

2.05 PROPORTIONING AND DESIGNING MIXES

A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. For the trial batch method, use an independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
1. Do not use the same testing agency for field quality control testing.
2. Limit use of fly ash to not exceed 25 percent of cement content by weight.

B. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of Work. Do not begin concrete production until proposed mix designs have been reviewed by Architect.

C. Design mixes to provide normal weight concrete with the following properties as indicated on drawings and schedules:
1. 3000 psi, 28-day compressive strength; water-cement ratio, 0.58 maximum (non-air-entrained), 0.46 maximum (air-entrained).

D. Water-Cement Ratio: Provide concrete for following conditions with maximum water-cement (W/C) ratios as follows:
1. Subjected to freezing and thawing: W/C 0.45.
2. Subjected to deicers/watertight: W/C 0.40.
3. Subjected to brackish water, salt spray, or deicers: W/C 0.40.

E. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
1. Ramps, slabs, and sloping surfaces: Not more than 3 inches.
2. Reinforced foundation systems: Not less than 1 inch and not more than 3 inches.
3. Concrete containing high-range water-reducing admixture (superplasticizer): Not more than 8 inches after adding admixture to site-verified 2 - 3 inch slump concrete.
4. Other concrete: Not more than 4 inches.

F. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in Work.

2.06 ADMIXTURES

A. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.

B. Use accelerating admixture in concrete slabs placed at ambient temperatures below 50 deg F.

C. Use high-range water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs, architectural concrete, parking structure slabs, concrete required to be watertight, and concrete with water-cement ratios below 0.50.

D. Use air-entraining admixture in exterior exposed concrete unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus or minus 1-1/2 percent within the following limits:
1. Concrete structures and slabs exposed to freezing and thawing, deicer chemicals, or hydraulic pressure:

a. 4.5 percent (moderate exposure); 5.5 percent (severe exposure) for 1-1/2 inch maximum aggregate.
b. 4.5 percent (moderate exposure); 6.0 percent (severe exposure) for 1 inch maximum aggregate.
c. 5.0 percent (moderate exposure); 6.0 percent (severe exposure) for 3/4 inch maximum aggregate.
d. 5.5 percent (moderate exposure); 7.0 percent (severe exposure) for 1/2 inch maximum aggregate.

2. Other concrete not exposed to freezing, thawing, or hydraulic pressure, or to receive a surface hardener: 2 to 4 percent air.

E. Use admixtures for water reduction and set accelerating or retarding in strict compliance with manufacturer's directions.

2.07 CONCRETE MIXING

A. Ready-Mixed Concrete: Comply with requirements of ASTM C 94, and as specified.
1. When air temperature is between 85 deg F and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

## PART 3 EXECUTION

3.01 GENERAL

A. Coordinate the installation of joint materials, vapor retarder/barrier, and other related materials with placement of forms and reinforcing steel.

3.02 FORMS

A. General: Design, erect, support, brace, and maintain formwork to support vertical, lateral, static, and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances and surface irregularities complying with the following ACI 347 limits:
1. Provide Class A tolerances for concrete surfaces exposed to view.
2. Provide Class C tolerances for other concrete surfaces.

B. Construct forms to sizes, shapes, lines, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in the Work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent cement paste from leaking.

C. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like for easy removal.

D. Provide temporary openings for clean-outs and inspections where interior area of formwork is inaccessible before and during concrete placement. Securely brace temporary openings and set tightly to forms to prevent losing concrete mortar. Locate temporary openings in forms at inconspicuous locations.

E. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

F. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.

G. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before placing concrete. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

3.03 VAPOR RETARDER/BARRIER INSTALLATION

A. General: Place vapor retarder/barrier sheeting in position with longest dimension parallel with direction of pour.

B. Lap joints 6 inches and seal with manufacturer's recommended mastic or pressure-sensitive tape.

1. Cover vapor retarder/barrier with sand cushion and compact to depth indicated.

3.04 PLACING REINFORCEMENT

A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports and as specified.
1. Avoiding cutting or puncturing vapor retarder/barrier during reinforcement placement and concreting operations. Repair damages before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved by Architect.

D. Place reinforcement to maintain minimum coverages as indicated for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.05 JOINTS

A. Construction Joints: Locate and install construction joints so they do not impair strength or appearance of the structure, as acceptable to Architect.

B. Provide keyways at least 1-1/2 inches deep in construction joints in walls and slabs and between walls and footings. Bulkheads designed and accepted for this purpose may be used for slabs.

C. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as indicated otherwise. Do not continue reinforcement through sides of strip placements.

D. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.

E. Isolation Joints in Slabs-on-Grade: Construct isolation joints in slabs-on-grade at points of contact between slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Joint fillers and sealants are specified in Division 7 Section "Joint Sealants."

F. Contraction (Control) Joints in Slabs-on-Grade: Construct contraction joints in slabs-on-grade to form panels of patterns as shown. Use saw cuts 1/8 inch wide by one-fourth of slab depth or inserts 1/4 inch wide by one-fourth of slab depth, unless otherwise indicated.
1. Form contraction joints by inserting premolded plastic, hardboard, or fiberboard strip into fresh concrete until top surface of strip is flush with slab surface. Tool slab edges round on each side of insert. After concrete has cured, remove inserts and clean groove of loose debris.
2. Contraction joints in unexposed floor slabs may be formed by saw cuts as soon as possible after slab finishing as may be safely done without dislodging aggregate.
3. If joint pattern is not shown, provide joints not exceeding 15 ft. in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third bays).
4. Joint fillers and sealants are specified in Division 7 Section "Elastomeric Sealants."

3.06 INSTALLING EMBEDDED ITEMS

A. General: Set and build into formwork anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached.

B. Install reglets to receive top edge of foundation sheet waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, relieving angles, and other conditions.

C. Install dovetail anchor slots in concrete structures as indicated on drawings.

D. Forms for Slabs: Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting-type screeds.

3.07 PREPARING FORM SURFACES

A. General: Coat contact surfaces of forms with an approved, nonresidual, low-VOC, form-coating compound before placing reinforcement.

B. Do not allow excess form-coating material to accumulate in forms or come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply according to manufacturer's instructions.

C. Coat steel forms with a nonstaining, rust-preventative material. Rust-stained steel formwork is not acceptable.

3.08 CONCRETE PLACEMENT

A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.

B. General: Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete," and as specified.

C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened sufficiently to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation at its final location.

D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete complying with ACI 309.
2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix to segregate.

E. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until completing placement of a panel or section.
1. Consolidate concrete during placement operations so that concrete is thoroughly worked around reinforcement, other embedded items and into corners.
2. Bring slab surfaces to correct level with a straightedge and strike off. Use bull floats or darbies to smooth surface free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
3. Maintain reinforcing in proper position on chairs during concrete placement.

F. Cold-Weather Placement: Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

G. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
1. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
2. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.

H. Hot-Weather Placement: When hot weather conditions exist that would impair quality and strength of concrete, place concrete complying with ACI 305 and as specified.
1. Cool ingredients before mixing to maintain concrete temperature at time of placement to below 90 deg F. Mixing water may be chilled or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedding in concrete.
3. Fog spray forms, reinforcing steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without puddles or dry areas.
4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, as acceptable to Architect.

3.09 FINISHING FORMED SURFACES

A. Rough-Formed Finish: Provide a rough-formed finish on formed concrete surfaces not exposed to view in the finished Work or concealed by other construction. This is the concrete surface having texture imparted by form-facing material used, with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.

B. Smooth-Formed Finish: Provide a smooth-formed finish on formed concrete surfaces exposed to view or to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or another similar system. This is an as-cast concrete surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective areas with fins and other projections completely removed and smoothed.

C. Grout-Cleaned Finish: Provide grout-cleaned finish on scheduled concrete surfaces that have received smooth-formed finish treatment.

1. Combine one part portland cement to one and one-half parts fine sand by volume, and a 50:50 mixture of acrylic or styrene butadiene-based bonding admixture and water to form the consistency of thick paint. Blend standard portland cement and white portland cement in amounts determined by trial patches so that final color of dry grout will match adjacent surfaces.
2. Thoroughly wet concrete surfaces, apply grout to coat surfaces, and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least 36 hours after rubbing.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.10 MONOLITHIC SLAB FINISHES

A. Scratch Finish: Apply scratch finish to monolithic slab surfaces to receive concrete floor topping or mortar setting beds for tile, portland cement terrazzo, and other bonded applied cementitious finish flooring material, and where indicated.

1. After placing slabs, finish surface to tolerances of F(F) 15 (floor flatness) and F(L) 13 (floor levelness) measured according to ASTM E 1155. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set with stiff brushes, brooms, or rakes.

B. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as specified; slab surfaces to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo; and where indicated.

1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating, using float blades or float shoes only, when surface water has disappeared, or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats or by hand-floating if area is small or inaccessible to power units. Finish surfaces to tolerances of F(F) 18 (floor flatness) and F(L) 15 (floor levelness) measured according to ASTM E 1155. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

C. Trowel Finish: Apply a trowel finish to monolithic slab surfaces exposed to view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or another thin film-finish coating system.

1. After floating, begin first trowel-finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and finish surfaces to tolerances of F(F) 20 (floor flatness) and F(L) 17 (floor levelness) measured according to ASTM E 1155. Grind smooth any surface defects that would telegraph through applied floor covering system.

D. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply a trowel finish as specified, then immediately follow by slightly scarifying the surface with a fine broom.

E. Nonslip Broom Finish: Apply a nonslip broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.11 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as specified to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with diagrams or templates of manufacturer furnishing machines and equipment.

## 3.12 CONCRETE CURING AND PROTECTION

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry, and windy weather protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply according to manufacturer's instructions after screeding and bull floating, but before power floating and troweling.

B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.

C. Curing Methods: Cure concrete by curing compound, by moist curing, by moisture-retaining cover curing, or by combining these methods, as specified.

D. Provide moisture curing by the following methods:
1. Keep concrete surface continuously wet by covering with water.
2. Use continuous water-fog spray.
3. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with a 4 inch lap over adjacent absorptive covers.

E. Provide moisture-retaining cover curing as follows:
1. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

F. Apply curing compound on exposed interior slabs and on exterior slabs, walks, and curbs as follows:
1. Apply curing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water sheen has disappeared). Apply uniformly in continuous operation by power spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
2. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.

G. Curing Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces, by moist curing with forms in place for the full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

H. Curing Unformed Surfaces: Cure unformed surfaces, including slabs, floor topping, and other flat surfaces, by applying the appropriate curing method.
1. Final cure concrete surfaces to receive finish flooring with a moisture-retaining cover, unless otherwise directed.

## 3.13 REMOVING FORMS

A. General: Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form-removal operations, and provided curing and protection operations are maintained.

B. Formwork supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements, may not be removed in less than 14 days or until concrete has attained at least 75 percent of design minimum compressive strength at 28 days. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members.

C. Form-facing material may be removed 4 days after placement only if shores and other vertical supports have been arranged to permit removal of form-facing material without loosening or disturbing shores and supports.

## 3.14 REUSING FORMS

A. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-coating compound as specified for new formwork.

B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use patched forms for exposed concrete surfaces except as acceptable to Architect.

## 3.15 CONCRETE SURFACE REPAIRS

A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removing forms, when acceptable to Architect.

B. Mix dry-pack mortar, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing.
1. Cut out honeycombs, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts down to solid concrete but in no case to a depth less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with bonding agent. Place patching mortar before bonding agent has dried.
2. For surfaces exposed to view, blend white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Provide test areas at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

C. Repairing Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes and fill with dry-pack mortar or precast cement cone plugs secured in place with bonding agent.
1. Repair concealed formed surfaces, where possible, containing defects that affect the concrete's durability. If defects cannot be repaired, remove and replace the concrete.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface tolerances specified for each surface and finish. Correct low and high areas as specified. Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having the required slope.
1. Repair finished unformed surfaces containing defects that affect the concrete's durability. Surface defects include crazing and cracks in excess of 0.01 inch wide or that penetrate to the reinforcement or completely through nonreinforced sections regardless of width, spalling, popouts, honeycombs, rock pockets, and other objectionable conditions.
2. Correct high areas in unformed surfaces by grinding after concrete has cured at least 14 days.
3. Correct low areas in unformed surfaces during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete. Proprietary underlayment compounds may be used when acceptable to Architect.
4. Repair defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose reinforcing steel with at least 3/4 inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

E. Perform structural repairs with prior approval of Architect for method and procedure, using specified epoxy adhesive and mortar.

F. Repair methods not specified above may be used, subject to acceptance of Architect.

## 3.16 QUALITY CONTROL TESTING DURING CONSTRUCTION

A. Labratory tests for concrete materials and mix design will be performed in accordance with Section 01 45 00 Quality Control, Testing Laboratory Services.

B. Sampling and testing for quality control during concrete placement may include the following, as directed by Architect.
   1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
      a. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
      b. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231, pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.
      c. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below, when 80 deg F and above, and one test for each set of compressive-strength specimens.
      d. Compression Test Specimen: ASTM C 31; one set of four standard cylinders for each compressive-strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.
      e. Compressive-Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yd. plus additional sets for each 50 cu. yd. more than the first 25 cu. yd. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.
   2. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.
   3. When total quantity of a given class of concrete is less than 50 cu. yd., Architect may waive strength testing if adequate evidence of satisfactory strength is provided.
   4. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
   5. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength and no individual strength test result falls below specified compressive strength by more than 500 psi.

C. Test results will be reported in writing to Architect, Structural Engineer, ready-mix producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the Project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.

D. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

E. Additional Tests: The testing agency will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

END OF SECTION 03 30 00 CAST IN PLACE CONCRETE

# SECTION 06 10 00 - ROUGH CARPENTRY

## PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
1. Wood framing.
2. Wood supports.
3. Wood blocking.
4. Wood cants.
5. Wood nailers.
6. Wood furring.
7. Wood grounds.
8. Plywood backing panels.

1.2 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product indicated.
1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that materials comply with requirements.

B. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses.

C. Research/Evaluation Reports: For the following:
1. Treated wood.
2. Power-driven fasteners.
3. Powder-actuated fasteners.
4. Expansion anchors.

## PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
1. Available Manufacturers: Subject to compliance with requirement.

2.2 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive stained or natural finish, mark grade stamp on end or back of each piece**,** or omit grade stamp and provide certificates of grade compliance issued by grading agency.
3. Provide dressed lumber, S4S, unless otherwise indicated.
4. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.

B. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
1. Allowable Design Stresses: Meet or exceed those indicated per manufacturer's published values determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

C. Wood Structural Panels:
1. Plywood: Either DOC PS 1 or DOC PS 2, unless otherwise indicated.
2. Oriented Strand Board: DOC PS 2.
3. Comply with "Code Plus" provisions in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial."

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA C2 (lumber) and AWPA C9 (plywood), except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).

B. Kiln-dry material after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.

C. Mark each treated item with treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.

D. Application: Treat items indicated on Drawings, and the following:
   1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
   2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
   3. Wood framing members less than 18 inches above grade.
   4. Wood floor plates that are installed over concrete slabs directly in contact with earth.

2.4 DIMENSION LUMBER

A. General: Of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated. Must match existing wood at the existing building. Architect will approve wood used.

B. Non-Load-Bearing Interior Partitions: No. 2 grade and any of the following species:
   1. Mixed southern pine; SPIB.
   2. Eastern softwoods; NELMA.
   3. Northern species; NLGA.
   4. Western woods; WCLIB or WWPA.

C. Framing Load-Bearing Partitions: No. 2 grade and any of the following species:
   1. Hem-fir or Hem-fir (north); NLGA, WCLIB, or WWPA.
   2. Southern pine; SPIB.
   3. Spruce-pine-fir (south) or Spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA.

D. Framing Load-Bearing Partitions: Any species and grade with a modulus of elasticity of at least **1,300,000 psi or 1,100,000 psi** and an extreme fiber stress in bending of at least **850 psi** 2-inch nominal thickness and 12-inch nominal width for single-member use.

E. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:
   1. Mixed southern pine, No. 2 grade; SPIB.
   2. Eastern softwoods, No. 2grade; NELMA.
   3. Northern species, No. 2grade; NLGA.
   4. Western woods, No. 2 Common grade; WCLIB or WWPA.

2.5 TIMBER AND MISCELLANEOUS LUMBER

A. For timbers of 5-inch nominal size and thicker, provide material complying with the following requirements:
   1. Species and Grade: Douglas fir-larch, Douglas fir-larch (north), or Douglas fir-south; No. 1 grade; NLGA, WCLIB, or WWPA.
   2. Species and Grade: Eastern hemlock, Eastern hemlock-tamarack, or Eastern hemlock-tamarack (north); No. 1 grade; NELMA or NLGA.
   3. Species and Grade: Southern pine, No. 1 grade; SPIB.

B. Provide miscellaneous lumber for support or attachment of other construction, including the following:
   1. Rooftop equipment bases and support curbs.
   2. Blocking.
   3. Cants.
   4. Nailers.
   5. Furring.
   6. Grounds.

C. For items of dimension lumber size, provide No. 2 grade lumber with 19 percent maximum moisture content of any species.

D. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:
   1. Mixed southern pine, No. 2 grade; SPIB.
   2. Eastern softwoods, No. 2 grade; NELMA.
   3. Northern species, No. 2 grade; NLGA.
   4. Western woods, No. 2 Common grade; WCLIB or WWPA.

2.6 PLYWOOD BACKING PANELS

A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than ¾" thick.

2.7 MISCELLANEOUS MATERIALS

A. Fasteners:
   1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
   2. Power-Driven Fasteners: CABO NER-272.
   3. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

B. Metal Framing Anchors: Made from hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.
   1. Manufacturers:
      a. Alpine Engineered Products, Inc.
      b. Cleveland Steel Specialty Co.
      c. Harlen Metal Products, Inc.
      d. KC Metals Products, Inc.
      e. Silver Metal Products, Inc.
      f. Simpson Strong-Tie Company, Inc.
      g. Southeastern Metals Manufacturing Co., Inc.
      h. United Steel Products Company, Inc.

   2. Research/Evaluation Reports: Provide products acceptable to authorities having jurisdiction and for which model code research/evaluation reports exist that show compliance of metal framing anchors, for application indicated, with building code in effect for Project.

   3. Allowable Design Loads: Meet or exceed those indicated per manufacturer's published values determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

C. Building Paper: Asphalt-saturated organic felt complying with ASTM D 226, Type I (No. 15 asphalt felt), unperforated.

D. Building Wrap Tape: Pressure-sensitive plastic tape recommended by building wrap manufacturer for sealing joints and penetrations in building wrap.

E. Sheathing Tape: Pressure-sensitive plastic tape for sealing joints and penetrations in sheathing and recommended by sheathing manufacturer for use with type of sheathing required.

F. Sill-Sealer Gaskets: Foam sill sealer sill plate gasket, closed cell foam in 3.5 x 5.5" width x 50' roll.

**PART 3 -** EXECUTION

3.1 INSTALLATION

Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

A. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.

B. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. CABO NER-272 for power-driven fasteners.
2. Published requirements of metal framing anchor manufacturer..
3. Table 23-II-B-1, "Nailing Schedule," and Table 23-II-B-2, "Wood Structural Panel Roof Sheathing Nailing Schedule," in the Uniform Building Code.
4. Table 2305.2, "Fastening Schedule," in the BOCA National Building Code.
5. Table 2306.1, "Fastening Schedule," in the Standard Building Code.
6. Table 602.3(1), "Fastener Schedule for Structural Members," and Table 602.3(2), "Alternate Attachments," in the International One- and Two-Family Dwelling Code.

C. Use finishing nails for exposed work, unless otherwise indicated. Countersink nail heads and fill holes with wood filler.

D. Framing Standard: Comply with AFPA's "Manual for Wood Frame Construction," unless otherwise indicated.

E. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

F. Comply with applicable recommendations contained in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial," for types of structural-use panels and applications indicated.

1. Comply with "Code Plus" provisions in above-referenced guide.

G. Apply building paper horizontally with 2-inch overlap and 6-inch end lap; fasten to sheathing with galvanized staples or roofing nails. Cover upstanding flashing with 4-inch overlap.

H. Apply sheathing tape to joints between sheathing panels and at items penetrating sheathing. Apply at upstanding flashing to overlap both flashing and sheathing.

END OF SECTION 06 10 00

## SECTION 06 20 00 - FINISH CARPENTRY

### PART 1 - GENERAL

1. RELATED DOCUMENTS
   a) Provisions established within the General and Supplementary General Conditions of the Contract, Division 1 - General Requirements , and the Drawings are collectively applicable to this Section.
   b) Section 06 10 00: Rough Carpentry c)
      Section 06 17 53: Wood Trusses
   d) Section 06 41 00: Cabinet Work
   e) Section 07 62 00: Sheet Metal Flashing and Trim
   f) Section 07 92 00: Sealants and Caulking
   g) Section 08 10 00: Packaged Doors and Frames
   h) Section 09 20 00: Gypsum Board Systems
   i) Section 09 90 00: Painting

2. REFERENCES
   a) Standards of the Following as Referenced
      (1) Architectural Woodwork Institute (AWI)
      (2) American National Standards Institute (ANSI)
      (3) National Electrical Manufacturer's Association (NEMA)
   b) Industry Standards
      (1) AWI: *Quality Standards, Guide Specifications & Quality Certification Program,* 1985 ed.
   c) Grading rules and standards of the following apply to materials furnished under this section:
      (1) American Lumber Standards Committee (ALSC)
      (2) American Plywood Association (APA)
      (3) National Hardware Lumber Association (NHLA)
      (4) National Bureau of Standards (NBS) Voluntary Product Standards (PS)
      (5) West Coast Lumber Inspection Bureau (WCLIB)
      (6) Western Wood Products Association (WWPA)
   d) Preservative treated material: meet specified standards of:
      (1) American Wood Preservers Association (AWPA)
      (2) American Wood Preservers Bureau (AWPB)
      (3) American Wood Preservers Institute (AWPI)
   e) Plywood Grading Rules
      (1) Softwood plywood: NBS PS-1-83 (2)
      Hardwood plywood: NBS PS-51-71

3. SUBMITTALS
   a) Samples, submit as follows:
      (1) Finish samples: Indicate selected finishes on samples of species and grade material specified.
      (2) Hardware items: Submit samples to Owner's Representative.

4. DELIVERY, STORAGE, AND HANDLING
   a) Schedule delivery of finish carpentry Work to Project site to coincide with installation but not to cause delay in Work.
   b) Immediately upon delivery, place materials indoors, under cover, protected from weather.
   c) Store materials minimum 6" above ground on framework or blocking; cover with protective waterproof covering providing for adequate air circulation and ventilation. Store in dry space.

5. PROJECT CONDITIONS
   a) Field measurements: Take field measurements to determine exact millwork sizes. Indicate exact dimensions on shop drawings.
   b) Installation of interior finish carpentry or millwork should not happen until spaces are enclosed and dry.

### PART 2 PRODUCTS

1. MATERIALS
   a) General
      (1) Dimensions: Indicated lumber dimensions are nominal. Actual dimensions conform to industry standards established by ALSC and the Rules Writing Agencies.
      (2) Moisture content: 12% maximum.
      (3) Surfacing: Surface four sides, S4S, unless otherwise indicated.
      (4) Grades for exposed and semi-exposed finish carpentry and millwork and plywood are

based on AWI Quality Standards. Grades for unexposed Work are based on Rules Writing Agencies grading rules.

b) Lumber
   (1) Species and grades
      (a) Unexposed millwork framing and blocking:
         (i) 1 x 3 MDF
         (ii) Members larger than 2" by 4": #2 grade
      (b) Door frames: Prehung: Custom Grade White Pine, kiln dried (KD)

c) Sheet Material
   (1) Plywood: Thicknesses indicated
      (a) Plywood soffits: APA 303, 6-W rough sawn fir.
      (b) Unexposed and semi-exposed millwork and general carpentry: APA A-C G-1, Exterior.

e) Interior
   (1) Floor base
   (2) Interior door trim

a) Shop Finishing
   (1) Finish millwork items in accord with finishing requirements of Painting section.
   (2) Provide finish Work smooth, free from abrasion, tool marks, raised grain, and other Grade prohibited defects on exposed surfaces.

b) Tolerances: Fabricate millwork items to AWI Custom Grade unless otherwise indicated.

3. SOURCE QUALITY CONTROL
   a) Inspection
      (1) Grade marks:
         (a) Identify lumber and plywood by official grade mark.
         (b) Lumber grade stamp to contain symbol of grading agency, mill number or name, grade of lumber, species or species grouping, or combination designation, rules under which graded, where applicable, and condition of seasoning at time of manufacture.
         (c) Plywood: Appropriate grade trademark of APA. Indicate type, grade, class and identification index, and inspection and testing agency mark.
         (d) Conceal grade marks on components to be exposed to view in finished Work.

**PART 3 EXECUTION**

1. PREPARATION
   a) General
      (1) Install Work plumb, level, true, and straight without distortions: conceal shims.
      (2) Provide finish Work smooth, free from abrasion, tool marks, raised grain markings, or similar defects on exposed surfaces.
      (3) Cut Work to fit unless specified to be shop fabricated or shop cut to exact size. Where carpentry and millwork abuts other finished Work, scribe and cut for accurate fit. Drill pilot holes at corners before making cut-outs.
      (4) Distribute defects allowed in quality grade specified to best overall advantage when installing job assembled Work.

2. INSTALLATION.
   a) Hardware: Install where indicated in accord with particular hardware specialty manufacturer's installation instructions.

3. CLEANING
   a) Clean wood, metal, and accessory items using neutral cleaner. Check and correct operating mechanisms for proper operation. Adjust and lubricate hinges, catches, and other operating hardware.

4. PROTECTION
   a) Protect finished and prefinished surfaces from Work of other trades.
   b) Prior to Date of Completion, examine Work for damage. Repair or replace damaged areas to original condition.

**END OF SECTION 06 20 00 - FINISH CARPENTRY**

## SECTION 07 2500
## WEATHER BARRIERS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Air Barriers: Materials that form a system to stop passage of air through exterior walls, joints between exterior walls and roof, and joints around frames of openings in exterior walls.

### 1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Water-resistive barrier under exterior cladding.

### 1.03 DEFINITIONS

A. Weather Barrier: Assemblies that form either water-resistive barriers, air barriers, or vapor retarders.

B. Air Barrier: Air tight barrier made of material that is relatively air impermeable but water vapor permeable, both to the degree specified, with sealed seams and with sealed joints to adjacent surfaces. Note: For the purposes of this specification, vapor impermeable air barriers are classified as vapor retarders.

C. Water-Resistive Barrier: Water-shedding barrier made of material that is moisture resistant, to the degree specified, intended to be installed to shed water without sealed seams.

### 1.04 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

B. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2014.

C. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials; 2013.

### PART 2 PRODUCTS

### 2.01 WEATHER BARRIER ASSEMBLIES

A. Air Barrier:
   1. On outside surface of sheathing of exterior walls use air barrier sheet, mechanically fastened type.

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

A. Air Barrier Sheet, Mechanically Fastened:
   1. Air Permeance: 0.004 cubic feet per minute per square foot (0.02 L/s/sq m), maximum, when tested in accordance with ASTM E2178.
   2. Water Vapor Permeance: 5 perms (286 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M Procedure A (desiccant procedure).
   3. Ultraviolet and Weathering Resistance: Approved in writing by manufacturer for minimum of 180 days weather exposure.
   4. Surface Burning Characteristics: Flame spread index of 25 or less, and smoke developed index of 50 or less, when tested in accordance with ASTM E84.
   5. Seam and Perimeter Tape: Polyethylene self adhering type, mesh reinforced, 2 inches (50 mm) wide, compatible with sheet material; unless otherwise specified.
   6. Products:
      a. DuPont Building Innovations; Tyvek Commercial Wrap with FlexWrap NF and Tyvek Tape: www.dupont.com.
      b. Substitutions: See Section 01 6000 - Product Requirements.

### 2.03 ACCESSORIES

A. Sealants, Tapes, and Accessories for Sealing Weather Barrier and Sealing Weather Barrier to Adjacent Substrates: As specified or as recommended by weather barrier manufacturer.

### PART 3 EXECUTION

### 3.01 INSTALLATION

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

B. Air Barriers: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.

C. Mechanically Fastened Sheets - On Exterior:
   1. Install sheets shingle-fashion to shed water, with seams generally horizontal.
   2. Overlap seams as recommended by manufacturer but at least 6 inches.
   3. Overlap at outside and inside corners as recommended by manufacturer but at least 12 inches (305 mm).
   4. For applications specified to be air tight, seal seams, laps, penetrations, tears, and cuts with self-adhesive tape; use only large-headed, gasketed fasteners recommended by the manufacturer.
   5. Install air barrier and vapor retarder UNDER jamb flashings.
   6. Install head flashings under weather barrier.
   7. At openings to be filled with frames having nailing flanges, wrap excess sheet into opening; at head, seal sheet over flange and flashing.

D. Openings and Penetrations in Exterior Weather Barriers:
   1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches (125 mm) onto weather barrier and at least 6 inches (150 mm) up jambs; mechanically fasten stretched edges.
   2. At openings to be filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with at least 4 inches (100 mm) wide; do not seal sill flange.
   3. At openings to be filled with non-flanged frames, seal weather barrier to all sides of opening framing, using flashing at least 9 inches (230 mm) wide, covering entire depth of framing.
   4. At head of openings, install flashing under weather barrier extending at least 2 inches (50 mm) beyond face of jambs; seal weather barrier to flashing.
   5. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
   6. Service and Other Penetrations: Form flashing around penetrating item and seal to weather barrier surface.

**3.02 PROTECTION**

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

**END OF SECTION**

**SECTION 07 6200**

**SHEET METAL FLASHING AND TRIM**

## PART 2 PRODUCTS

### 1.01 SHEET MATERIALS

A. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, (0.0239 inch) (0.61 mm) thick base metal.

### 1.02 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Form pieces in longest possible lengths.

C. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.

D. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

E. Fabricate corners from one piece with minimum 18 inch (450 mm) long legs; seam for rigidity, seal with sealant.

F. Fabricate flashings to allow toe to extend 2 inches (50 mm) over roofing gravel. Return and brake edges.

### 1.03 ACCESSORIES

A. Fasteners: Galvanized steel, with soft neoprene washers.

B. Primer: Zinc chromate type.

C. Concealed Sealants: Non-curing butyl sealant.

D. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.

E. Plastic Cement: ASTM D4586/D4586M, Type I.

## PART 3 EXECUTION

### 2.01 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.

### 2.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil (0.4 mm).

### 2.03 INSTALLATION

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

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

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

**END OF SECTION**

# SECTION 07 92 13 – ELASTOMERIC JOINT SEALANTS (CAULKING)

## A. PART 1 GENERAL

1. REFERENCES
   a) Standards of the Following as Referenced:
      (1) American Society for Testing and Materials (ASTM)
      (2) Federal Specifications (Fed. Spec.)
      (3) Sealant and Waterproofer's Institute (SWI)
   b) Industry Standards:
      (1) SWI: Association quality standard guidelines for sealant installation.
2. DEFINITIONS
   a) Terms:
      (1) Caulk: Process of filling joints, without regard to type of material.
      (2) Caulking compound: Material used in filling joints and seams, having properties of adhesion and cohesion: not be required to have extensibility and recovery properties, usually applied to joints at interior of structures.
      (3) Joint failure: Caulked joint exhibiting one or more of the following characteristics:
         (a) Leaks air or water.
         (b) Sealant:
            (i) migrates
            (ii) loses adhesion or cohesion
            (iii) does not cure
            (iv) discolors
            (v) stains adjacent Work
            (vi) develops bubbles, air pockets, or voids
      (4) Sealant: Weatherproof elastomer used in filling and sealing joints, having properties of adhesion, cohesion, extensibility under tension, compressibility, and recovery: designed to make joints air and watertight. Material is designed generally for application to joints at exterior of structures and for other joints subject to movement.
3. SUBMITTALS
   a) Product data: Submit manufacturer's product description indicating conformance with specified requirements and installation instructions for each type sealant. Indicate preparation requirements for each substrate condition.
   b) Color Samples:
      (1) Submit samples of manufacturer's standard caulking material colors and special colors indicated at least 30 days prior to application.
      (2) Samples: Actual materials or literature depicting actual material colors. Owner's Representive reserves right to reject Work not in accord with selected colors, based upon samples submitted.
      (3) Should Owner's Representative select manufacturer meeting specified requirements, except for minimum color range requirements, he shall be responsible for furnishing special colors within color range requirements. Submit special colors for Owner's Representative acceptance.
4. PROJECT CONDITIONS
   a) Weather Conditions:
      (1) Installation of materials under adverse weather conditions is prohibited: install only within manufacturer recommended temperature range.
      (2) Proceed with Work only when forecasted weather conditions are favorable for joint cure and development of high early bond strength.
      (3) Install materials only when temperatures are in lower third of manufacturer's recommended installation temperature, wherever joint width is affected by ambient temperature variations.
5. WARRANTY
   a) Warranty Work to be free from defects in materials and workmanship, including joint failure, for one year period: begin at Date of Completion.

## B. PART 2 PRODUCTS

1. MATERIALS
   a) Polyurethane (Type 1 Sealant):
      (1) One-part conforming to FS TT-S-00227E, Class A, Type I (self-leveling) and ASTM-9200.
      (2) Color: As selected by Owner.
      (3) Acceptable products:
         (a) Urexpan NR-201, Pecora.
         (b) Sonolastic SL-1, Sonneborn.
         (c) Vulkem 45, Mameco.
   b) Silicone, General Purpose (Type 2 Sealant):
      (1) One-part rubber based silicone conforming to FS TT-S-001543, Class A, Type II and ASTM C-920.

(2) Color: Match substrate.
(3) Acceptable products:
(a) 790 Building Sealant, Dow Corning.
(b) Silpurf, General Electric.

c) Silicone, Paintable (Type 3 Sealant):
(1) One-part silicone rubber sealant for interior use.
(2) Acceptable product: Silicone Rubber Sealant, Paintable Dow Corning.

d) Silicone, Sanitary (Type 4 Sealant):
(1) One-part conformaing to FS TT-S-001543, F.D.A. Regulation 21 CFR177.2600, and FDA Food Additive Regulation 121.2514.
(2) Color: White.
(3) Acceptable Products.
(a) (1) 786 Silicone Rubber Sealant, Dow Corning.
(b) SCS1702, General Electric.

e) Acrylic Latex (Type 5 Sealant):
(1) One-part, non-sag, acrylic latex, meeting requirements of ASTM C834.
(2) Acceptable products:
(a) AC-20, Pecora.
(b) Sonolac, Sonneborn-Contech, Inc.

f) Acrylic Sealant (Type 6 Sealant):
(1) One-part, non-sag, acrylic polymeric conforming to FS TT-S-00230.
(2) Acceptable products:
(a)Unicrylic 60, Pecora.

g) Polyurethane (Type 7 Sealant):
(1) One-part conforming to FS TT-S-00227E, Class A, Type II (non-sag) and ASTM.920.
(2) Color: As selected by Owner.
(3) Acceptable products:
(a)Dynatrol I, Pecora.
(b)Sonolastic NP-1, Sonneborn.
(c)Vulkem 921, Mameco.

h) Foamed-in-place (Type 8 Sealant):
(1) Polycell.

2 .ACCESSORIES

a) Joint Cleaner: Type recommended by sealant manufacturer for substrates indicated.
b) Joint Primer/Sealer: Type recommended by sealant manufacturer for conditions encountered.
c) Bond Breaker Tape: Plastic tape applied to contact surfaces where bond to substrate or joint filler must be avoided for sealant material performance.
d) Sealant Backer Rod: (if required)
(1) Type: Compressible rod stock polyethylene foam, polyethylene jacketed polyurethane foam, butyl rubber foam, or neoprene foam: open or closed cell: type recommended by sealant manufacturer for compatibility with material.
(2) Provide size and shape of rod to control joint depth, break bond at joint bottom, form optimum shape of bead on back side, and minimize possibility of extrusion when joint is compressed.
e) Tooling Agent: Agent recommended by sealant or caulk manufacturer to ensure contact of material with inner joint faces.
f) Divider Strips: Synthetic rubber or closed cell synthetic foam not less then 1/16" thick and full depth of caulking material: approved by manufacturers of dissimilar materials as being compatible with each other.

**C. PART 3 EXECUTION**

1. PREPARATION

a) Protection of Adjacent Surfaces:
(1) Protect by applying masking material or manipulating application equipment to keep materials in joint. Allowing tape to touch cleaned surfaces to receive sealant if masking materials are used is prohibited.
(2) Remove misapplied caulking materials from surfaces using solvents and methods recommended by manufacturer.
(3) Restore surfaces to original condition and appearance where caulking materials have been removed.
b) Surface Protection:
(1) Clean joint surfaces immediately before caulking joints. Remove dirt, insecure coatings, moisture, and other substances interfering with bond.
(2) Etch concrete and masonry joint surfaces to remove alkalinity, unless caulking material manufacturer's product data indicates alkalinity does not interfere with bond and performance.

Etch with sealant manufacturer's recommended materials in accord with sealant manufacturer's reviewed installation instructions and product data.

(3) Roughen joint surfaces on vitreous coated and similar non-porous materials, unless caulking material manufacturer's data indicates equal bond strength as porous surfaces. Rub with fine abrasive cloth or wool to produce dull sheen.

2.APPLICATION

a) General: Comply with sealant material manufacturer's printed installation instructions, except where more stringent requirements are required, indicated, or specified.

b) Primer: Prime or seal joint surfaces where recommended by caulking material manufacturer. Do not allow primer/sealer to spill or migrate onto adjacent surfaces.

c) Backer Rod: Install for all caulking materials, except where recommended to be omitted by material manufacturer for application when needed.

d) Sealant:

(1) Employ installation techniques which will insure caulking materials are deposited in uniform, continuous ribbons without gaps or air pockets, with complete wetting of joint bond surfaces.

(2) Fill joint to form slight cove, so joint will not trap moisture and debris where horizontal joints are between horizontal and vertical surface.

(3) Do not allow materials to overflow or spill onto adjacent surfaces. Use masking tape or other precautionary devices to prevent staining of adjacent surfaces.

(4) Remove excess and misplaced materials as Work progresses. Clean adjoining surfaces to eliminate evidence of misplaced materials, without damage to adjacent surfaces or finishes.

(5) Cure caulking materials in accord with manufacturer's product data to obtain high early bond strength, internal cohesive strength, and surface durability.

3. SCHEDULE

a) Sealant Type And Application

b) Type 1

(1) Horizontal control and expansion joints in concrete flooring and pedestrian paving and at junctures between these materials and other adjacent materials.

c) Type 2

(1) Sealing of joints between plumbing fixtures and substrates and between plastic laminate splashes and adjacent tops and walls.

d) Type 3

(1) General caulking as part of interior painting in joints subject to movement.

e) Type 4

(1) Sealing joints between countertops and substrates in kitchen and elsewhere which may be in contact with food.

f) Type 5

(1) General caulking as part of interior painting.

g) Type 6 or 8

(1) Setting sill plates to slabs.

h) Type 7

(1) Control joints in masonry work and at juncture between masonry work and adjacent materials.

(2) Sealing around perimeter of all windows, doors, and other items penetrating exterior siding.

**END OF SECTION 07 92 13 – ELASTOMERIC JOINT SEALANTS (CAULKING)**

# SECTION 09 20 00 – PLASTER AND GYPSUM BOARD SYSTEMS

## A. PART 1 - GENERAL

1. SUMMARY
   - A) Related Sections
     - (1) Section 06 10 00: Rough Carpentry
     - (2) Section 06 20 00: Finish Carpentry
     - (3) Section 07 21 00: Building Insulation
     - (4) Section 09 90 00: Painting
2. REFERENCES
   - A) Standard of the Following as Referenced
     - (1) American National Standards Institute (ANSI)
     - (2) Federal Specification (Fed. Spec.)
     - (3) Gypsum Association (GA)
     - (4) Underwriters' Laboratories, Inc. (UL)
3. SYSTEM DESCRIPTION
   - A) Design Requirements
     - (1) Fire resistance ratings: Construct designated walls and ceilings in accord with indicated UL design numbers or other approved association numbers.
4. PRODUCT STORAGE, AND HANDLING REQUIREMENTS
   - A) Storage PER SECTION 01 66 00
     - (1) Stack gypsum board providing continuous support for gypsum board to prevent sagging. Stack gypsum board in manner to prevent long lengths over short lengths. Stock per perpendicular to trusses on floors.
     - (2) Store adhesives in dry area: provide protection against freezing at all times.
     - (3) Do not overload floor system.
5. PROJECT CONDITIONS
   - A) Install gypsum board only after building is enclosed, except for pre rock conditions as required by plans, local codes and ordinances.
   - B) Ventilation:
     - (1) Provide ventilation during and following adhesive and joint treatment application.
     - (2) Use temporary air circulators in enclosed areas lacking natural ventilation.
     - (3) Allow additional drying time between coats of joint treatment, under slow drying conditions.
     - (4) Protect installed materials from drafts during hot, dry weather.
   - C) Texture: Owner's Representative must approve condition of taping joints prior to application of texture.
6. SUBMITTALS
   - A) Submit under provisions Section of 01 25 00 - Submittals.
   - B) Submit two 2' x 2' texture samples for Owner approval.

## B. PART 2 - PRODUCTS

1. MANUFACTURERS
   - A) Acceptable manufacturers: Products of the following manufacturers are acceptable for use except certain manufacturer's products may be required for use in particular rated assemblies. Those rated products ONLY are acceptable for use.
     - (1) Georgia-Pacific Corp.
     - (2) Gold Bond Building Products/National Gypsum Company
     - (3) U.S. Gypsum Company
     - (4) Dens Glass Sheathing by Georgia Pacific
     - (5) Approved Equal
2. COMPONENTS
   - A) Gypsum Board
     - 1) Regular gypsum board: Meeting ASTM C36-85 and Fed. Spec. SS-L-30D, Type III, Grade R, Class 1 forms A and C: thicknesses indicated, tapered edges.
     - 2) Fire retardant gypsum board: Meeting SSTM C36-85 and Fed. Spec. SS-L-30D, Type III, Grade X, Class 1: Type X, 5/8" thickness, tapered edges.
     - 3) Special rated gypsum board:
       - (a) Acceptable product: U.S. Gypsum Company: Sheetrock Firecode and Firecode "C". (b) Characteristics:
         - (i) Thickness: 5/8"
         - (ii) Meet ASTM C36-85 and Fed. Spec. SS-L-30D, Type III, Grade X, Class 1.
         - (iii) Specially formulated Type X core to achieve superior performance when used in specific fire rated assemblies of UL, GA, FM, WHI, and other code recognized testing laboratories or agencies and indicated in specific test reports generally as "....proprietary type X....".

c) Gypsum board: per structural plans.
1) Sound Control Materials: Specified in Building Insulation section.
2) Fire-rated Insulation for Rated Assemblies: Specified in Building Insulation section.
3) Gypsum Area Wall Separation (Fire Wall)
Acceptable manufacturers:
(i) Georgia-Pacific Corp.
(ii) Gold Bond Building Product/National Gypsum Company
(iii) U.S. Gypsum Company

4) UL system fire resistive rating: Indicated on drawings.

5) Water-resistant Dens Glass sheathing - Meeting ASTM D 3273 test. Rigid substrate for a wide variety of air or water resistive barrier systems. Fire rated and non-fire rated. Gypsum sheathing: per structural plans.
a) Sound Control Materials: Specified in Building Insulation section.
b) Fire-rated Insulation for Rated Assemblies: Specified in Building Insulation section.
c) Gypsum Area Wall. Wet locations, as per plan and exterior portal ceilings.
(1) Acceptable manufacturers:
(i) Georgia-Pacific Corp.

6) Water-resistant gypsum board: Meeting ASTM C630-85 and Fed. Spec. SS-L-30D, Type VII, Grade W or X, Class 2: thickness indicated, Regular and Type X, tapered edges.
d) Fasteners
(1) Screws for gypsum board application :
(i)Application of single layer of gypsum board to wood framing: Meet ASTM C1002-83. Type W. 1-1/4" length, bugle head.
(ii) Gypsum board to gypsum board application: Meet ASTM C1002-83, Type G, 1-1/2" bugle head.
(iii) Applications not listed: Conform to gypsum board manufacturer's product literature for conditions encountered.
e) Joint Materials and Adhesives
1) Joint tape: Meeting ASTM C475-81 and Fed. Spec. SS-J-570B. Type II: perforated.
2) Joint compound: Meeting ASTM C475-81 and Fed. Spec. SS-J-570B. Type I: vinyl base, ready-mixed tape embedment and topping compounds.
f) Accessories
1) Corner reinforcement: Galvanized steel with 1-1/4" wide flanges, similar to U.S. Gypsum Company Dur-A-Bead #103.
2) Metal jamb, ceiling, and casing trim: Manufacturer's standard "U" and "L" shaped galvanized member providing edge protection and neat finished edges: similar to U.S. Gypsum Company, 200-A and 200-B, respectively.
3) Resilient channel: Minimum 25 gauge galvanized steel: manufacturer's standard type: similar to U.S. Gypsum Company, RC-1 Resilient Channel.
4) J-metal base. Types approved by Owner's Representative for intended use.
g) Texture
1) Owner's Representative shall approve condition of taping joints prior to application of texture.
2) Ceilings: See plans and as approved by Owner's Representative.
3) Walls: See plans and as approved by Owner's Representative.

## C. PART 3 - EXECUTION

1. INSTALLATION
A) Furring: Attach resilient channels to all locations drawings specify, at spacings required in accord with requirements of tested and rated assembly indicated.
B) Gypsum Board -- General:
1) Install gypsum board in accord with manufacturer's product data, GA-216-85, and ASTM C840-87, except where more stringent requirements are specified.
2) Use gypsum board of maximum lengths to minimize end joints. Stagger end joints.
3) Abut gypsum board without forcing. Fit ends and edges of gypsum board. Do not place butt ends against tapered edges.
4) Support ends and edges of gypsum board panels on framing or furring members.
5) Install gypsum board accessories in accord with gypsum board manufacturer's data.
6) Smoke barriers: Construct at locations indicated. Seal all terminations and penetrations required by City.
C) Gypsum Board -- Single Layer Installation
(1) Ceilings:
(a) Apply gypsum board with long dimension at right angle to framing or RC channel.
(b) Terminate ends and edges of gypsum board on furring members.
(c) Attach in accord with requirements for tested and rated assemblies as indicated.

(d) For two-layer system, refer to USG Gypsum Construction Handbook.

(2) Walls:
   (a) Apply gypsum board horizontally or approved design.
   (b) Stagger end joints in opposite sides of partitions.
   (c) Terminate gypsum board ends on framing or furring members.

(3) Fastening per code.

D) Gypsum Board Joint Treatment
   1) Apply joint compound to joints and angles in gypsum board and embed joint tape. Apply two additional coats of compound over tape, allow drying between coats, featheredge and sand or damp sponge smooth each coat.
   2) Walls: Apply three coats compound, minimum, over fastener depressions: sand or damp sponge smooth each coat: bring to level plane of gypsum board surface.
   3) Apply minimum of two coats of compound over fastener depressions at all ceilings, sand or damp sponge smooth both coats. Leave ready for texturing as specified by Owner's Representative.
   4) Fastener pop:
      (a) Repair fastener pop by installing second fastener approximately 1-1/2" from fastener pop and reseat fastener.
      (b) Where face paper is punctured, drive new fastener approximately 1-1/2" from defective fasteners and remove defective fastener.
      (c) Fill damaged surface with compound and sand or damp sponge smooth to level of plane of gypsum board.
   5) Fill cracks with compound: sand or damp sponge smooth and flush.
   6) Dust surfaces leaving ready for decoration.

E) Floor/Wall Joint
   1) Install j-metal trim ¼" off finished floor materials at all floor / wall joints and per manufacturers recommendations and as approved by Owner's Representative.

F) Texture
   1) Install per manufacturers recommendations and approval of Owner's representative.

**END SECTION 09 20 00 – PLASTER AND GYPSUM BOARD SYSTEMS**

Bridge over voids and small cracks with elastomeric sealant. Feather product to zero at edges using brush, knife, or trowel, to prevent the repaired area from telegraphing through subsequent finishes. Do no apply more than ¼" in depth in one application. Spot prime with Acrylic primer. Follow with finish coats.

3. Cracks or openings from 1/16" wide to 3/8" wide:
Route out surface material from crack or opening to remove loose unsound material. Flush out the opening to remove all dust. Fill crack or opening with elastomeric patching sealant; provide small crest over the opening to allow for shrinkage. Feather product to zero at edges using brush, knife, or trowel, to prevent the repaired area from telegraphing through subsequent finishes. Do no apply more than ¼" in depth in one application. Spot prime with Acrylic primer. Follow with finish coats.

C. Repair of stucco cracks or openings at exterior horizontal surfaces and parapet caps:
1. Remove any failed patching materials and to underlying stucco substrate.
2. Remove existing paint film on stucco substrate methods by scraping or sanding.
3. Repair existing cracks in stucco substrate as described in article 3.3B for wall surfaces.
4. Install acrylic and Portland cement patching compound with stainless steel trowel to prepared surface to uniform thickness per manufactures recommendations.
5. Embed fiberglass mesh immediately in the wet base coat. Smooth surface of base coat with trowel until the reinforcing mesh is fully embedded.
6. Apply Portland cement mortar/aggregate texture coat over patching material using coarse wet brush by throwing (splattering) mixture over patched areas to approximate original surface texture.
7. Allow base coat to cure according to manufacturers recommended duration.
8. Prime substrate with compatible primer as required for finish system indicated.

4. CLEANING AND PROTECTION
A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

5. EXTERIOR COATING OF EXTERIOR STUCCO
A. Acrylic Coating:
1. See Section 09 2423 Portland Cement Stucco for finish coating.

END OF SECTION

**SECTION 09 2236.23**

**METAL LATH**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Metal lath for cement and gypsum plaster.

### 1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Sheathing on exterior walls.

B. Section 07 2500 - Weather Barriers: Weather barrier under exterior plaster and stucco.

C. Section 09 2400 - Portland Cement Plastering.

### 1.03 REFERENCE STANDARDS

A. ASTM C841 - Standard Specification for Installation of Interior Lathing and Furring; 2003 (Reapproved 2013).

B. ASTM C847 - Standard Specification for Metal Lath; 2014a.

C. ASTM C933 - Standard Specification for Welded Wire Lath; 2014.

D. ASTM C1032 - Standard Specification for Woven Wire Plaster Base; 2014.

### 1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

### 2.02 LATH ASSEMBLIES

A. Provide completed assemblies with the following characteristics:
   1. Maximum Deflection of Vertical Assemblies: 1:360 under lateral point load of 100 lbs (445 N).
   2. Maximum Deflection of Horizontal Assemblies: 1:240 deflection under dead loads and wind uplift.

### 2.03 LATH

A. Diamond Mesh Metal Lath: ASTM C847, galvanized; self-furring.
   1. Weight: To suit application and as specified in ASTM C841 or ASTM C1063 for framing spacing.
   2. Weight: 2.5 lb/sq yd (1.4 kg/sq m).
   3. Backed with treated paper.

B. Ribbed Metal Lath: ASTM C847, galvanized; 3/8 inch (9 mm) thick.
   1. Weight: To suit application and as specified in ASTM C841 or ASTM C1063 for framing spacing.

C. Welded Wire Lath: ASTM C933; galvanized; with 2 inch (50 mm) square openings, of weight to suit application, comply with deflection criteria, and as specified in ASTM C841 for framing spacing.

D. Beads, Screeds, Joint Accessories, and Other Trim: Depth governed by plaster thickness, and maximum possible lengths.

### 2.04 ACCESSORIES

A. Anchorage: Tie wire, nails, and other metal supports, of type and size to suit application; to rigidly secure materials in place, galvanized.

## PART 3 EXECUTION

### 3.01 INSTALLATION - GENERAL

A. Install interior lath and furring for gypsum plaster in accordance with ASTM C841.

### 3.02 CONTROL AND EXPANSION JOINT INSTALLATION

A. Install control and expansion joints.

### 3.03 LATH INSTALLATION

A. Apply lath taut, with long dimension perpendicular to supports.

B. Lap ends minimum 1 inch (25 mm). Secure end laps with tie wire where they occur between supports.

C. Lap sides of diamond mesh lath minimum 1-1/2 inches (38 mm).

D. Continuously reinforce internal angles with corner mesh, except where the metal lath returns 3 inches (75 mm) from corner to form the angle reinforcement; fasten at perimeter edges only.

E. Place corner bead at external wall corners; fasten at outer edges of lath only.

F. Place base screeds at termination of plaster areas; secure rigidly in place.

G. Place 4 inch (100 mm) wide strips of lath centered over junctions of dissimilar backing materials, and secure rigidly in place.

H. Place lath vertically above each top corner and each side of door frames to 6 inches (150 mm) above ceiling line.

I. Place casing beads at terminations of plaster finish. Butt and align ends. Secure rigidly in place.

J. Place additional strip mesh diagonally at corners of lathed openings. Secure rigidly in place.

**END OF SECTION**

## SECTION 09 2400
## PORTLAND CEMENT PLASTERING

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Portland cement plaster for installation over metal lath and solid surfaces.

### 1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood stud framing for plaster.

B. Section 09 2236.23 - Metal Lath: Metal furring and lathing for plaster.

### 1.03 REFERENCE STANDARDS

A. ASTM C926 - Standard Specification for Application of Portland Cement-Based Plaster; 2015b.

### 1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittals procedures.

### 1.05 QUALITY ASSURANCE

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

### 1.06 FIELD CONDITIONS

A. Do not apply plaster when substrate or ambient air temperature is under 50 degrees F (10 degrees C) or over 80 degrees F (27 degrees C).

B. Maintain minimum ambient temperature of 50 degrees F (10 degrees C) during installation of plaster and until cured.

### PART 2 PRODUCTS

### 2.01 PORTLAND CEMENT PLASTER ASSEMBLIES

A. Exterior Stucco: Portland cement plaster system, made of finish, brown, and scratch coat and reinforcing mesh.
   1. Provide weather resistive barrier and air barrier as part of the system.

### 2.02 PLASTER MATERIALS

A. Portland Cement, Aggregates, and Other Materials: In accordance with ASTM C926.

B. Premixed Base Coat: Mixture of cement, aggregate, and proprietary admixtures for scratch and brown coats, installed in accordance with ASTM C926.

C. Premixed Textured Coating: Polymer modified acrylic coating, integrally colored, trowel applied to substrates prepared in accordance with manufacturer's recommendations.
   1. Color: As indicated on drawings.

D. Water: Clean, fresh, potable and free of mineral or organic matter that could adversely affect plaster.

### 2.03 METAL LATH

A. Metal Lath and Accessories: As specified in Section 09 2236.23. Use metal lath as plaster base at _____.

B. Beads, Screeds, and Joint Accessories: As specified in Section 09 2236.23.

### 2.04 PLASTER MIXES

A. Over Metal Lath: Three-coat application, mixed and proportioned in accordance with manufacturer's instructions.

B. Premixed Plaster Materials: Mix in accordance with manufacturer's instructions.

C. Mix only as much plaster as can be used prior to initial set.

D. Mix materials dry, to uniform color and consistency, before adding water.

E. Protect mixtures from freezing, frost, contamination, and excessive evaporation.

F. Do not retemper mixes after initial set has occurred.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify the suitability of existing conditions before starting work.

B. Metal Lath and Accessories: Verify lath is flat, secured to substrate, and joint and surface perimeter accessories are in place.

### 3.02 PLASTERING

A. Apply premixed plaster in accordance with manufacturer's instructions.

B. Apply plaster in accordance with ASTM C926.

C. Three-Coat Application Over Metal Lath:
   1. Apply first coat to a nominal thickness of 3/8 inch (9 mm).
   2. Apply second coat to a nominal thickness of 3/8 inch (9 mm).
   3. Apply finish coat to a nominal thickness of 1/8 inch (3 mm).

D. Moist cure base coats.

E. Apply second coat immediately following initial set of first coat.

F. After curing, dampen previous coat prior to applying finish coat.

G. Avoid excessive working of surface. Delay troweling as long as possible to avoid drawing excess fines to surface.

H. Moist cure finish coat for minimum period of 48 hours.

**END OF SECTION**

**SECTION 09 24 23.13 - EXTERIOR STUCCO REPAIR**

**PART 1 - GENERAL**

1. SUMMARY
   A. This Section includes surface cleaning, surface preparation, crack repair of cementitious stucco.

2. SUBMITTALS
   A. Product Data: For each type of product indicated.

   B. Samples for Initial Selection: For each type of topcoat product indicated.

3. DELIVERY, STORAGE, AND HANDLING
   A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
      1. Maintain containers in clean condition, free of foreign materials and residue.
      2. Remove rags and waste from storage areas daily.

4. PROJECT CONDITIONS
   A. Apply primer and patching materials only when temperature of surfaces to be patched and ambient air temperatures are between 50 and 95 deg F.

   B. Do not apply priming or patching materials in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg above the dew point; or to damp or wet surfaces.

5. MANUFACTURERS
   A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      1. CTS Cement.
      2. El Rey
      3. Parex USA.
      4. Sto USA.

6. MATERIAL GENERAL
   A. Material Compatibility: Provide block fillers, primers, and patching materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

   B. Material Quality: Provide manufacturer's best-quality material of the various coating types specified in part 3 that are factory formulated and recommended by manufacturer for application indicated. Material containers not displaying manufacturer's product identification will not be acceptable.

      1. Proprietary Names: Furnish manufacturer's material data and certificates of performance for proposed substitutions.

7. PATCHING MATERIALS
   A. Exterior Cementitious Patching Compound Materials: Provide cementitious patching compounds and repair materials specifically manufactured for surface preparation and crack repair on vertical and horizontal surfaces prior to repainting. Utilize flexible acrylic modified Portland cement waterproofing and basecoat for repair of horizontal surfaces:

      1. Binder base: acrylic co-polymers liquid additive compatible with Portland cement.
      2. Water based: VOC compliant.
      3. Additive/Portland Cement Ratio: Per product manufacturer’s recommendations.
      4. Color: Gray
      5. Vapor Permeability: 2.5 grams (ASTM E96)
      6. Water penetration resistance: withstands hydrostatic pressure.
      7. Freeze-thaw resistance: 60 cycle, pass (ASTM C67, EIMA 101.01)
      8. Flexibility: Pass 1/8” mandrel bend.
      9. Width: Install full width of horizontal parapet surface. 4” minimum width at other non-parapet surfaces.
   B. Fiberglass Reinforcing Mesh: Provide fiberglass reinforcing mesh embedded into cementitious patch

compound material for crack repair on horizontal surfaces.

1. 4.5 oz. per square yard
2. ASDTM D-5035
3. Warp-150, Weft 160
4. Impact Resistance – 25-49 inch-lbs.
5. Width – Install full width of horizontal parapet surface. 4" minimum width at other non-parapet horizontal surfaces.

8. STUCCO FOG KOTE

A. Provide El Rey Fog Kote © (or equal) at exterior wall stucco patch, entire wall from inside or outside corner to cover patch, and 6" below grade to over parapet to roofing material. Install per manufacturer's recommendations. Color to match existing.

9. MISCELLANEOUS MATERIALS

A. Detergent Cleaning Solution: Mix 2 cups of tetra sodium polyphosphate, 1/2 cup of laundry detergent, 5 quarts of 5 percent sodium hypochlorite bleach, and 15 quarts of warm water for each 5 gal. of solution required.

B. Job-Mixed Mold, Mildew, and Algae Remover: Mix 2 cups of tetrasodium polyphosphate, 5 quarts of 5 percent sodium hypochlorite bleach, and 15 quarts of hot water for every 5 gal. of solution required.

**PART 2 - EXECUTION**

1. EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Masonry (Clay and CMU): 12 percent.
3. Wood: 15 percent.
4. Plaster: 12 percent.
5. Gypsum Board: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

2. PREPARATION, GENERAL REQUIREMENT

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Prepare existing surfaces as follows:

1. Clean existing surfaces to remove loose dirt and dust.
2. Remove surface films that will prevent proper adhesion.
3. Patch and repair damaged and cracked surfaces.

3. SURFACE PREPARATION FOR EXTERIOR CEMENTITIOUS STUCCO

A. Remove efflorescence and chalk. Do not recoat surfaces if moisture content of surfaces or alkalinity exceeds that permitted in manufacturer's written instructions. Cementitious Materials: Prepare cement panel surfaces to be recoated. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. .

1. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not recoat surfaces if moisture content exceeds that permitted in manufacturer's written instructions.

B. Repair of exterior vertical stucco (wall surface) openings and cracks:

1. Repair of cracks or openings no greater than 1/32" wide:
   Apply one coat of Acrylic primer and follow with finish coats.

2. Repair of cracks or openings from 1/32" up to 1/16" wide:

**SECTION 09 9113**

**EXTERIOR PAINTING**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints and stains.

C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
   1. Exposed surfaces of steel lintels and ledge angles.
   2. Exposed walls as shown on drawings..

D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Floors, unless specifically indicated.
   6. Brick, glass unit masonry, architectural concrete, cast stone, integrally colored plaster and stucco.
   7. Glass.
   8. Concealed pipes, ducts, and conduits.

### 1.02 REFERENCE STANDARDS

A. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.

B. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition, www.paintinfo.com.

### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.

### 1.04 QUALITY ASSURANCE

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

### 1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

### 1.06 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior paint and finishes during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 50 degrees F (10 degrees C) for exterior; unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.

B. Paints:
   1. Behr Process Corporation: www.behr.com.
   2. Benjamin Moore & Co: www.benjaminmoore.com.
   3. Diamond Vogel Paints: www.diamondvogel.com.
   4. Glidden Professional, a product of PPG Architectural Coatings: www.gliddenprofessional.com.
   5. PPG Paints: www.ppgpaints.com.
   6. Sherwin-Williams Company: www.sherwin-williams.com.

C. Substitutions: See Section 01 6000 - Product Requirements.

### 2.02 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready mixed, unless required to be a field-catalyzed paint.
   1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Supply each paint material in quantity required to complete entire project's work from a single production run.
   3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

### 2.03 PAINT SYSTEMS - EXTERIOR

A. Paint E-OP - Exterior Surfaces to be Painted, Unless Otherwise Indicated: Including concrete, concrete masonry units, brick, fiber cement siding, primed wood, and primed metal.
   1. Two top coats and one coat primer.
   2. Top Coat(s): Exterior Latex; MPI #10, 11, 15, 119, or 214.
   3. Top Coat Sheen:
      a. Semi-Gloss: MPI gloss level 5; use this sheen at all locations.
   4. Primer: As recommended by top coat manufacturer for specific substrate.

B. Paint E-TR-W - Stain on Wood:
   1. 2 coats stain.
   2. Stain: Exterior Solid Stain for Wood, Water Based; MPI #16.

### 2.04 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Fiber Cement Siding: 12 percent.
   2. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
   3. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

**3.02 PREPARATION**

A. Clean surfaces thoroughly and correct defects prior to application.

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

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

F. Concrete:

G. Masonry:

H. Fiber Cement Siding: Remove dirt, dust and other foreign matter with a stiff fiber brush. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.

I. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed surfaces before installation.

J. Exterior Wood to Receive Transparent Finish: Remove dust, grit, and foreign matter; seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes with tinted exterior calking compound after sealer has been applied. Prime concealed surfaces.

**3.03 APPLICATION**

A. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.

B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance.

E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

F. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed.