

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Coordination Drawings.
 - 2. Administrative and supervisory personnel.
 - 3. Project meetings.
 - 4. Requests for Interpretation (RFIs).
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.
- C. Related Sections include the following:
 - 1. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's Construction Schedule.
 - 2. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

1.4 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
 4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's Construction Schedule.
 2. Preparation of the Schedule of Values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.
 9. Project closeout activities.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.5 COORDINATION DRAWINGS

- A. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:
1. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 2. Indicate required installation sequences.

B. Development of Coordination Drawings

1. The Contractor and the HVAC, Plumbing, Fire Protection, Electrical and any other involved subcontractors are each required to participate in the creation and updating of one complete composite set of coordination drawings. The purpose of the coordination drawings is to preplan the installation of HVAC, Electrical, Fire Protection, Plumbing and any other involved subcontractors in relation to the existing and/or new facility, its structure, ceilings, etc. It is the intent of these coordination drawings to identify coordination problems and interferences prior to installation [and to establish the layout of this work where exposed in finished spaces for the Architect's review]. Drawings shall show the work of all trades covered [(including both existing and new)], shall show clearly in both plan and section that all work can be installed without interference. This effort shall be led by the Contractor.
2. Time of Coordination of Drawing Preparation: The coordination drawings shall be prepared, submitted and accepted before any sleeves or inserts are set, any floor openings are core drilled, or any mechanical or electrical equipment or bases or related work is fabricated or installed. The completion of the coordination drawings by each trade will be a prerequisite for any progress payment for any material or equipment delivered or for any work by these trades. The preparation of coordination drawings acceptable to the Architect is a contract requirement, the cost of which is included in the contract price. The cost of coordination drawings shall be included as a separate line item in the Schedule of Values.
3. Procedure
 - a. The Contractor shall produce drawings on CADD which are compatible with both the Owner's and Architect's system, at a scale which is acceptable to the Architect, showing constraints such as structure, ceiling, soffit and fascia location, existing items, etc. These shall be used as the coordination drawing base. The Contractor shall transmit, either electronically or by disk, his drawing to the HVAC subcontractor who, including his sheet metal subcontractor, shall provide scale location of duct pipe, necessary supports, equipment outlines, etc. The HVAC subcontractor shall transmit, either electronically or by disk, these drawings to the Plumbing subcontractor who shall place the location of his pipe, hangers, equipment outlines, etc., on these drawings; that is, add his work to the drawings which already show the HVAC work. These drawings shall then be transmitted, either electronically or by disk, to the Fire Protection subcontractor who shall add his pipe location, hangers, equipment outlines, etc., to the drawings. These drawings shall be transmitted, either electronically or by disk, to the Electrical subcontractor who shall add his conduit, cable tray runs, equipment outlines, etc., to the drawings and transmit them to other involved subcontractors or if there are none, back to the Contractor. If other subcontractors are involved, they shall follow the same format as above.
 - b. [In the case where this work will be exposed in finished spaces, special consideration must be given to its layout, for example, ductwork, piping, conduit, etc., shall be run in parallel lines and the spacing between them shall be uniform, i.e., equal or similar in dimension. The Contractor shall confer with the Architect in advance of initiating the coordination drawing effort in order to ascertain the Architect's expected result.]

- c. The Contractor will then hold a meeting with all involved subcontractors in attendance to resolve any conflicts or problems. After the coordination drawings are reviewed and any conflicts resolved, the originals shall be signed by the Contractor and each of the involved subcontractors. Any non-resolvable conflicts shall be brought to the attention of the Architect.
 - d. The Contractor shall then make copies and submit the signed coordination drawings to the Architect, as record drawings. He shall also transmit copies to the above subcontractors. Coordination Drawings submitted to the Architect shall also be on CADD discs which are compatible with both Owner's and Architect's systems.
 - e. The Contractor shall retain the drawings to be used in preparing as-built drawings.
4. Work Installed Without Prior Approval: Any work fabricated or installed prior to the signing of coordination drawings shall be at the subcontractor's risk. Subsequent relocations required to avoid interferences shall be made without additional expense to the Owner. If interference develops, the Contractor shall recommend (subject to Architect's review and acceptance) which work shall be relocated, regardless of which was installed first.

1.6 SUBMITTALS

- A. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1.7 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

1.8 PROJECT MEETINGS

- A. Architect will schedule and administer preconstruction meeting, periodic progress meetings, and specially called meetings throughout progress of the work.
 - 1. Preside at meetings.
 - 2. Record the minutes; include significant proceedings and decisions.
 - 3. Reproduce and distribute copies of minutes to Owner and Contractor.
- B. Contractor shall make physical arrangements for meetings.
- C. Representatives of contractors, subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

D. Agenda:

1. Discuss items of significance that could affect progress, including the following:
 - a. Submissions of insurance certificates
 - b. List of major subcontractors and suppliers
 - c. Projected Construction Schedules.
 - d. Tentative construction schedule.
 - e. Phasing.
 - f. Critical work sequencing and long-lead items.
 - g. Designation of key personnel and their duties.
2. Project Coordination: Designation of responsible personnel with address, telephone number and emergency telephone number – all included in a document distributed to all parties.
3. Procedures and processing of:
 - a. Field decisions.
 - b. Proposal requests
 - c. Procedures for processing field decisions and Change Orders.
 - d. Procedures for RFIs.
 - e. Procedures for testing and inspecting.
 - f. Procedures for processing Applications for Payment.
 - g. Distribution of the Contract Documents.
 - h. Submittal procedures.
 - i. Maintenance and Preparation of Record Documents.
 - j. Use of the premises and existing building.
 - k. Work restrictions.
 - l. Owner's occupancy requirements.
 - m. Responsibility for temporary facilities and controls.
 - n. Construction waste management and recycling.
 - o. Parking availability.
 - p. Office, work, and storage areas.
 - q. Equipment deliveries and priorities.
 - r. First aid.
 - s. Security.
 - t. Progress cleaning.
4. Construction facilities, controls and construction aids.
5. Temporary utilities.
6. Safety and first aid procedures
7. Housekeeping procedures.
8. Owner's Operations and Contractor access to the area of construction and site.
9. OSHPD Procedures.
10. Working hours.

E. Minutes: Contractor will record and distribute meeting minutes.

F. Preinstallation Conferences: Contractor shall conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. The Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility problems.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written recommendations.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

G. Progress Meetings: Architect will conduct progress meetings at weekly intervals. Coordinate dates of meetings with preparation of payment requests.

1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in

planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

- a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

- 1) Review schedule for next period.

- b. Review present and future needs of each entity present, including the following:

- 1) Review, approve of minutes of previous meeting.
- 2) Review of unsettled matters.
- 3) Problems which impede Construction Schedule.
- 4) Pending changes and substitutions.
- 5) Review proposed changes for:
 - a) Effect on Construction Schedule and on completion date.
 - b) Effect on other contracts of the Project.
- 6) Field observations, problems, conflicts.
- 7) Review of work progress since previous meeting.
- 8) Contractor's statement of corrective measures and procedures to regain projected schedule.
- 9) Revisions to Construction Schedule.
- 10) Progress, schedule, during succeeding work period.
- 11) Coordination of schedules.
- 12) Maintenance of quality standards.
- 13) Other business.
- 14) Interface requirements.
- 15) Sequence of operations.
- 16) Status of submittals.
- 17) Deliveries.
- 18) Off-site fabrication.
- 19) Access.
- 20) Site utilization.
- 21) Temporary facilities and controls.
- 22) Work hours.
- 23) Hazards and risks.
- 24) Progress cleaning.
- 25) Quality and work standards.
- 26) Status of correction of deficient items.

- 27) Field observations.
 - 28) RFIs.
 - 29) Status of proposal requests.
 - 30) Pending changes.
 - 31) Status of Change Orders.
 - 32) Pending claims and disputes.
 - 33) Documentation of information for payment requests.
3. Minutes: Architect will record and distribute to Contractor the meeting minutes.
 4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
 - a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

H. Coordination Meetings: Contractor shall conduct Project coordination meetings at [biweekly] intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to Combined Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Schedule Updating: Revise Combined Contractor's Construction Schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Review present and future needs of each contractor present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.

- 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Hazards and risks.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Change Orders.
3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.9 REQUESTS FOR INTERPRETATION (RFIs)

- A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.
 1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
 1. Project name.
 2. Date.
 3. Name of Contractor.
 4. Name of Architect.
 5. RFI number, numbered sequentially.
 6. Specification Section number and title and related paragraphs, as appropriate.
 7. Drawing number and detail references, as appropriate.
 8. Field dimensions and conditions, as appropriate.
 9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 10. Contractor's signature.
 11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
 - a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.
- C. Software-Generated RFIs: Software-generated form with substantially the same content as indicated above.
 1. Attachments shall be electronic files in Adobe Acrobat PDF format.

D. Architect's Action: Architect will review each RFI, determine action required, and return it. Allow five working days for Architect's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.

1. The following RFIs will be returned without action:

- a. Requests for approval of submittals.
- b. Requests for approval of substitutions.
- c. Requests for coordination information already indicated in the Contract Documents.
- d. Requests for adjustments in the Contract Time or the Contract Sum.
- e. Requests for interpretation of Architect's actions on submittals.
- f. Incomplete RFIs or RFIs with numerous errors.

2. Architect's action may include a request for additional information, in which case Architect's time for response will start again.

3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."

- a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Owner in writing within 10 working days of receipt of the RFI response.

E. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within three working days if Contractor disagrees with response.

F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number including RFIs that were dropped and not submitted.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Preliminary Construction Schedule.
2. Contractor's Construction Schedule.
3. Submittals Schedule.
4. Daily construction reports.
5. Material location reports.
6. Field condition reports.
7. Special reports.

- B. Related Sections include the following:

1. Division 01 Section "Payment Procedures" for submitting the Schedule of Values.
2. Division 01 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
3. Division 01 Section "Photographic Documentation" for submitting construction photographs.
4. Division 01 Section "Submittal Procedures" for submitting schedules and reports.
5. Division 01 Section "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

- B. Cost Loading: The allocation of the Schedule of Values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by Architect.
- C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- E. Event: The starting or ending point of an activity.
- F. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- G. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- H. Major Area: A story of construction, a separate building, or a similar significant construction element.
- I. Milestone: A key or critical point in time for reference or measurement.
- J. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.
- K. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 SUBMITTALS

- A. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:
 - 1. Scheduled date for first submittal.
 - 2. Specification Section number and title.
 - 3. Submittal category (action or informational).
 - 4. Name of subcontractor.
 - 5. Description of the Work covered.
 - 6. Scheduled date for Architect's final release or approval.

- B. Preliminary Construction Schedule: Submit two opaque copies.
 - 1. Approval of cost-loaded preliminary construction schedule will not constitute approval of Schedule of Values for cost-loaded activities.
- C. Contractor's Construction Schedule: Submit two opaque copies of initial schedule, large enough to show entire schedule for entire construction period.
 - 1. Submit an electronic copy of schedule, using software indicated, on CD-R, and labeled to comply with requirements for submittals. Include type of schedule (Initial or Updated) and date on label.
- D. Daily Construction Reports: Submit two copies at weekly intervals.
- E. Field Condition Reports: Submit two copies at time of discovery of differing conditions.
- F. Special Reports: Submit two copies at time of unusual event.

1.5 QUALITY ASSURANCE

- A. Pre-scheduling Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to the Preliminary Construction Schedule and Contractor's Construction Schedule, including, but not limited to, the following:
 - 1. Discuss constraints, including phasing, work stages, area separations, interim milestones and partial Owner occupancy.
 - 2. Review delivery dates for Owner-furnished products.
 - 3. Review time required for review of submittals and resubmittals.
 - 4. Review requirements for tests and inspections by independent testing and inspecting agencies.
 - 5. Review time required for completion and startup procedures.
 - 6. Review and finalize list of construction activities to be included in schedule.
 - 7. Review submittal requirements and procedures.
 - 8. Review procedures for updating schedule.

1.6 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from parties involved.

2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
 2. Initial Submittal: Submit concurrently with preliminary bar-chart schedule. Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 - a. At Contractor's option, show submittals on the Preliminary Construction Schedule, instead of tabulating them separately.
 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."
- B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.
 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
 2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.

3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
 4. Startup and Testing Time: Include not less than 5 days for startup and testing.
 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
- D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase.
 2. Work under More Than One Contract: Include a separate activity for each contract.
 3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
 4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Division 01 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Division 01 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 6. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use of premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
 7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 - l. Startup and placement into final use and operation.

8. Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:

- a. Structural completion.
- b. Permanent space enclosure.
- c. Completion of mechanical installation.
- d. Completion of electrical installation.
- e. Substantial Completion.

E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.

F. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

G. Computer Software: Prepare schedules using a program that has been developed specifically to manage construction schedules.

1. Microsoft Project, Professional 2002, for Windows NT operating system.

2.3 PRELIMINARY CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within seven days of date established for the Notice to Proceed.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 60 days of construction. Include skeleton diagram for the remainder of the Work.

2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within 30 days of date established for the Notice to Proceed. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require 3 months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

C. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.

2.5 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. CPM Schedule: Prepare Contractor's Construction Schedule using a computerized, time-scaled CPM network analysis diagram for the Work.
1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 30 days after date established for the Notice to Proceed.
 - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
 2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 3. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.
- B. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.
 - e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - h. Work by Owner that may affect or be affected by Contractor's activities.
 - i. Testing.
 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
 4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
- C. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:

1. Contractor or subcontractor and the Work or activity.
2. Description of activity.
3. Principal events of activity.
4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.
8. Total float or slack time.
9. Average size of workforce.
10. Dollar value of activity (coordinated with the Schedule of Values).

D. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

1. Identification of activities that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

2.6 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (refer to special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Emergency procedures.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Construction Change Directives received and implemented.
16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial Completions and occupancies.
19. Substantial Completions authorized.

B. Material Location Reports: At weekly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials

previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

- C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.7 SPECIAL REPORTS

- A. General: Submit special reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.
 - 1. In-House Option: Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
 - 2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.
- B. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one day before each regularly scheduled progress meeting.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate Actual Completion percentage for each activity.
- C. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01 32 00

SECTION 01 32 33 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs prior to Demolition Phase
 - 2. Periodic construction photographs.
- B. Related Sections include the following:
 - 1. Division 01 Section "Submittal Procedures" for submitting photographic documentation.
 - 2. Division 01 Section "Closeout Procedures" for submitting digital media and construction videotapes as Project Record Documents at Project closeout.
 - 3. Division 01 Section "Demonstration and Training" for submitting videotapes of demonstration of equipment and training of Owner's personnel.
 - 4. Division 02 Section "Selective Demolition" for photographic documentation before selective demolition operations commence.

1.3 SUBMITTALS

- A. Key Plan: Submit key plan of Project areas with notation of vantage points marked for location and direction of each photograph. As appropriate, indicate elevation or story of construction. Include same label information as corresponding set of photographs.
- B. Construction Photographs: Submit two prints of each photographic view within seven days of taking photographs.
 - 1. Format: 4-by-6-inch smooth-surface matte prints on single-weight commercial-grade photographic paper, enclosed back to back in clear plastic sleeves that are punched for standard 3-ring binder.
 - 2. Identification: On back of each print, provide an applied label or rubber-stamped impression with the following information:
 - a. Name of Project.
 - b. Name of Contractor.
 - c. Date photograph was taken if not date stamped by camera.

- d. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
 - e. Unique sequential identifier.
- 3. Digital Images: Submit a complete set of digital image electronic files with each submittal of prints on CD-ROM. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as the sensor, uncropped.

1.4 COORDINATION

- A. Auxiliary Services: Cooperate with photographer and provide auxiliary services requested, including access to Project site and use of temporary facilities, including temporary lighting required to produce clear, well-lit photographs without obscuring shadows.

1.5 USAGE RIGHTS

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

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

- A. Digital Images: Provide images in uncompressed TIFF format, produced by a digital camera with minimum sensor size of 6.0 megapixels, and at an image resolution of not less than 1600 by 1200 pixels.

PART 3 - EXECUTION

3.1 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 filename for each image.
 - 2. Field Office Images: Maintain one set of images on CD-ROM in the field office at Project site, available at all times for reference. Identify images same as for those submitted to Architect.

- C. Preconstruction Photographs: Before commencement of any work in the building, take digital photographs of Project areas and surrounding areas, including existing items to remain during construction, from different vantage points.
- D. Periodic Construction Photographs: Take digital photographs as needed to document the stages of construction listed below. Select vantage points to show status of construction and progress since last photographs were taken.
 - 1. At completion of demolition phase
 - 2. At completion of metal stud framing
 - 3. At completion of electrical and mechanical rough-in / prior to installation of gypsum wall board
 - 4. At completion of above-ceiling work / after completion of suspended ceiling grid / prior to the installation of ceiling tiles.

END OF SECTION 01 32 33

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SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. All architectural components shall be in accordance with the seismic requirements of the governing codes; refer to Division 01 Section "Summary."
- C. Related Sections include the following:
 - 1. Division 01 Section "Payment Procedures" for submitting Applications for Payment and the Schedule of Values.
 - 2. Division 01 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
 - 3. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
 - 4. Division 01 Section "Photographic Documentation" for submitting construction photographs.
 - 5. Division 01 Section "Quality Requirements" for submitting test and inspection reports.
 - 6. Division 01 Section "Closeout Procedures" for submitting warranties.
 - 7. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 8. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 9. Division 01 Section "Demonstration and Training" for submitting videotapes of demonstration of equipment and training of Owner's personnel.
 - 10. Divisions 02 through 49 Sections for specific requirements for submittals in those Sections.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Architect's and Contractor's responsive action.
- B. Informational Submittals: Written information that does not require Architect's and Contractor's responsive action. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Submittals Schedule: Comply with requirements in Division 01 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Additional time may be required if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: If resubmittal review is necessary, process in same manner as initial review.
 - 4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, additional time for review may be required.
 - 5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously from the Contractor to Architect and to Architect's consultants, submittal will be returned to Architect before being returned to Contractor.
- D. Identification: Place a permanent label or title block on each submittal for identification.
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 - 2. Provide a space approximately 3-1/2 by 5 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect and Contractor.
 - 3. Submission Requirements
 - a. Each separate section of the Specification Divisions 1 through 48 lists the submittals that are requested and will be accepted for review by the Architect. Submittals not requested specifically will be returned to Contractor without review.

- b. For Divisions 21, 22, 23, 25, 26, 27, 28 and 48 certain material list and review submittal requests are identified by a "Submittal Code" in the "Submittal" or "Acceptable Manufacturers" paragraph of each section.

1) Submittal Code Legend

<u>Submittal Code Letter</u>	<u>Description</u>
A	No submittals required.
B	Provide submittals other than included herein as specified in Submittals, Inspection, Inspections and Certificates, and Manufacturer's Supervision or Inspection Service or Additional Services or Startup paragraphs.
C	Include name of proposed manufacturer on Material (Manufacturers) List of factory manufactured items. After Architect review of manufacturer, provide submittal as indicated.
D	Submit Manufacturers Shop Drawings and/or catalog cuts for factory manufactured items.
E	Submit list of manufacturer's figure numbers.
F	Submit manufacturer's proposed equipment and/or materials.
G	Submit a single line or riser diagram showing wire size, conduit size, number of conductors, equipment identification and location.
H	Submit drawings indicating the physical layout of the wires in each run, and the size of each conduit.
I	Submit certified technical performance data.
J	Include information for product in the operating and maintenance manual.

4. Include the following information on label for processing and recording action taken:

- a. Project name.
- b. Date.
- c. Name and address of Architect.
- d. Name and address of Contractor.
- e. Name and address of subcontractor.
- f. Name and address of supplier.
- g. Name of manufacturer.
- h. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g. 06 10 00.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g. 06 10 00.01.A).
- i. Number and title of appropriate Specification Section.
- j. Drawing number and detail references, as appropriate.

- k. Location(s) where product is to be installed, as appropriate.
- l. Other necessary identification.
- m. Submittals shall be addressed to:

EwingCole
Shop Drawing Department
Discovery Business Center
15231 Laguna Canyon Road, Suite 200
Irvine, CA 92618

E. Deviations: Highlight or otherwise specifically identify deviations from the Contract Documents on submittals.

F. Additional Copies: Unless additional copies are required for final submittal, and unless Architect or Contractor observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

- 1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
- 2. Additional copies submitted will not be marked with action taken and will be returned.

G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect and Contractor will return submittals, without review, received from sources other than Contractor.

1. Transmittal Form: Provide locations on form for the following information:

- a. Project name.
- b. Date.
- c. Destination (To:).
- d. Source (From:).
- e. Names of subcontractor, manufacturer, and supplier.
- f. Category and type of submittal.
- g. Submittal purpose and description.
- h. Specification Section number and title.
- i. Drawing number and detail references, as appropriate.
- j. Transmittal number, numbered consecutively.
- k. Submittal and transmittal distribution record.
- l. Remarks.
- m. Signature of transmitter.

2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect and Contractor on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.

H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

- 1. Note date and content of previous submittal.

2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked "Reviewed" or "Reviewed as Noted".
- I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
 - J. Use for Construction: Use only final submittals with mark indicating "Reviewed" or "Reviewed as Noted" taken by Architect.

1.5 CONTRACTOR'S USE OF ARCHITECT'S CAD FILES

- A. General: At Contractor's written request, copies of Architect's CAD files will be provided to Contractor for Contractor's use in connection with Project, only when specifically allowed in the specifications.

1.6 REQUEST FOR INFORMATION (RFI)

- A. If after reviewing the entire set of Contract Documents a subcontractor requires additional information to proceed with his work, he shall forward an RFI to the Contractor for the required information. The Contractor shall thoroughly review the Contract Documents and provide the required information to the subcontractor. If the Contractor, after thoroughly reviewing the entire Contract Documents, requires additional information, he shall forward an RFI to the Architect requesting additional information. The Contractor is required to attempt to answer subcontractor's RFI in lieu of automatically forwarding them on to the Architect.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable. Submittals submitted without this information will be returned not reviewed.
 3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Standard color charts (actual samples, not reproductions).

- e. Manufacturer's catalog cuts.
 - f. Wiring diagrams showing factory-installed wiring.
 - g. Printed performance curves.
 - h. Operational range diagrams.
 - i. Mill reports.
 - j. Standard product operation and maintenance manuals.
 - k. Compliance with specified referenced standards.
 - l. Testing by recognized testing agency.
 - m. Application of testing agency labels and seals.
 - n. Notation of coordination requirements.
- 4. Submit Product Data before or concurrent with Samples.
 - 5. Number of Copies: Submit three copies of Product Data, unless otherwise indicated. Architect will return one copy. Contractor shall provide and distribute reviewed copies as needed.
- C. Shop Drawings: Prepare Project-specific information in a clear and thorough manner, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittals of Architect's CAD Drawings are specifically permitted.
- 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shopwork manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Design calculations.
 - j. Compliance with specified standards.
 - k. Notation of coordination requirements.
 - l. Notation of dimensions established by field measurement.
 - m. Relationship to adjoining construction clearly indicated.
 - n. Seal and signature of professional engineer if specified.
 - o. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
 - 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 40 inches (750 by 1000 mm).
 - 3. Number of Copies: Submit three (3) copies of each submittal. Architect will return one copy.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of appropriate Specification Section.
3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit three (3) full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit three (3) sets of Samples. Architect will retain one (1) Sample sets; remainder will be returned.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three (3) sets of paired units that show approximate limits of variations.

- E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
1. Type of product. Include unique identifier for each product.
 2. Number and name of room or space.
 3. Location within room or space.
 4. Number of Copies: Submit three (3) copies of product schedule or list, unless otherwise indicated. Architect will return one (1) copies.
 - a. Mark up and retain one returned copy as a Project Record Document.
- F. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation" for Construction Manager's action.
- G. Submittals Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
- H. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."
- I. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."
- J. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
1. Name, address, and telephone number of entity performing subcontract or supplying products.
 2. Number and title of related Specification Section(s) covered by subcontract.
 3. Drawing number and detail references, as appropriate, covered by subcontract.
 4. Number of Copies: Submit three (3) copies of subcontractor list, unless otherwise indicated. Architect will return one (1) copy.

2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
1. Number of Copies: Submit three (3) copies of each submittal, unless otherwise indicated. Architect will not return copies.
 2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 3. Test and Inspection Reports: Comply with requirements specified in Division 01 Section "Quality Requirements."

- B. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."
- C. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
- D. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- H. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- I. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- J. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- K. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- L. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.
 - 4. Product and manufacturers' names.
 - 5. Description of product.
 - 6. Test procedures and results.
 - 7. Limitations of use.

- M. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."
- N. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- O. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- P. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- Q. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- R. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- S. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
1. Preparation of substrates.
 2. Required substrate tolerances.
 3. Sequence of installation or erection.
 4. Required installation tolerances.
 5. Required adjustments.
 6. Recommendations for cleaning and protection.
- T. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
1. Name, address, and telephone number of factory-authorized service representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.

6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- U. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.
- V. Construction Photographs: Comply with requirements specified in Division 01 Section "Photographic Documentation."
- W. Material Safety Data Sheets (MSDSs): Submit information directly to Owner; do not submit to Architect.
1. Architect will not review submittals that include MSDSs and will return the entire submittal for resubmittal.

2.3 DELEGATED DESIGN

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit three (3) copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Review Shop Drawings, Product Data and Samples prior to submission.
- B. Determine and verify:
1. Field measurements.
 2. Field construction criteria.
 3. Catalog numbers and similar data.
 4. Conformance with specifications.

- C. Coordinate each submittal with other submittals as well as with requirements of the Work and Contract Documents.
- D. Advise priority requirements, if any, for review of submittals.
1. If submittals are made in large quantities from any one subcontractor or a large quantity of drawings from several subcontractors all at one time, the normal time required by the Architect for review cannot be expected to suffice; Contractor shall, in such instances, indicate the priority and/or sequence of review desired.
 2. If no priority requirement is indicated, Architect will review submittals in the order received.
- E. Identify all material list items and submittals by the title of the specification section, paragraph, and page from which they are specified.
- F. Contractor and/or manufacturer SHALL NOT use the color red when marking their notations on the submittal.
- G. Approval Stamp: Stamp each submittal with a uniform, approval stamp as indicated below. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
- H. Each requested submittal shall be checked by the originating contractor (or subcontractor) and [Contractor] [and Construction Manager] prior to submission to Architect, and shall carry the following certification on each sheet by [both the Construction Manager and] [both the subcontractor and] the Contractor:

WE HEREBY STATE THAT WE HAVE REVIEWED, INSPECTED AND CHECKED THE INFORMATION SUBMITTED AND VOUCH FOR ITS ACCURACY AND COMPLIANCE WITH THE CONTRACT DOCUMENTS AND SURROUNDING CONDITIONS.

[Contractor and] [Construction Manager] [Subcontractor]

(Signature)

Per _____ Date: _____

Submittals submitted without this certification will be returned, not reviewed, for resubmission.

- I. Distribution by Contractor
1. Distribute reproductions of Shop Drawings and Product Data which carry the Architect review stamp.
 2. Distribute samples which carry the Architect review stamp as directed by the Architect.

3.2 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

<u>Submittal Code Letter</u>	<u>Description</u>
A	Reviewed: Indicates the submission conforms generally to the design concept and the information given in the Contract Documents. Architect will not include any comments. Fabrication can proceed. No further submissions are required.
B	Reviewed As Noted: Indicates the submission conforms generally to the design concept and the information given in the Contract Documents, except for corrections indicated. Fabrication can proceed on the basis that Contractor is fully responsible for incorporating indicated corrections into the work. No further submissions are required.
C	Reviewed As Noted and Resubmit: Indicates the submission conforms generally to the design concept and the information given in the Contract Documents, except for corrections indicated. Fabrication can proceed on the basis that Contractor is fully responsible for incorporating indicated corrections into the work. Resubmission is required for confirmation of corrections noted.
D	Rejected: Procedural or technical nonconformity with the design concept and the information given in the Contract Documents.
E	Resubmit: Indicates that corrections of a major nature are required, should be incorporated in the submittal, and the submittals shall be resubmitted for Architect's further review. Fabrication should NOT proceed pending further review.
F	Not Reviewed: Nonconformance with the requirements herein.

- C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 01 33 00

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect or Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections include the following:
 - 1. Section 014100 - Testing Laboratory Services (For Information Only).
 - 2. Division 01 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
 - 3. Division 01 Section "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and

completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

- C. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
- D. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- E. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- F. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- G. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction. If individual sections specify more than 5 years, the specified number of years shall take precedence.

1.4 CONFLICTING REQUIREMENTS

- A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 SUBMITTALS

- A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Description of test and inspection.
3. Identification of applicable standards.
4. Identification of test and inspection methods.
5. Number of tests and inspections required.
6. Time schedule or time span for tests and inspections.
7. Entity responsible for performing tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

C. Reports: Prepare and submit certified written reports that include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- C. Authorized Installer: A firm which has been authorized by a manufacturer to appropriately install their product.

- D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- E. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- F. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- G. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirement for specialists shall not supersede building codes and regulations governing the Work.
- H. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.7 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility in Section 01 41 00 - Testing Laboratory Services, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 - 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor and the contract sum will be adjusted by Change Order.

- B. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- F. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

- G. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 15 days of date established for commencement of the Work/the Notice to Proceed.

1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.8 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
 2. Comply with the Contract Document requirements for Division 01 Section "Cutting and Patching."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

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SECTION 01 41 00 - TESTING LABORATORY SERVICES (For Information Only)

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for Testing and inspecting services.
- B. Owner will employ and pay for the services of an Independent Testing Agency and Geotechnical Engineering Consultant to perform certain specified testing as listed hereinafter
 - 1. Contractor shall cooperate with the Testing Agency and Geotechnical Engineer to facilitate the execution of their required services.
 - 2. Employment of the Testing Agency and Geotechnical Engineer shall in no way relieve Contractor's obligations to perform the Work of the Contract.
 - 3. Special Inspections in accordance with Chapter 17 of the IBC 2003.
 - 4. OSHPD Testing, Inspection & Observation (TIO) Program
- C. Contractor shall employ and pay for the services of an Independent Testing Agency and Geotechnical Engineer to perform all other specified services and testing not included herein, and the retesting of "failed" areas.
- D. Related Sections include the following:
 - 1. Division 31 Section "Erosion and Sediment Control" monitoring storm water runoff from site.
 - 2. Division 31 "Earthwork" Inspection of excavation, materials, compaction and compaction tests.
 - 3. Division 31 "Topsoil" Materials, chemical analysis.
 - 4. Division 31 "Timber Piles" Materials, preservative treatment and bearing values.
 - 5. Division 31 "Caissons" - Materials, side friction values and bearing values.
 - 6. Division 32 "Asphaltic Concrete Paving" Inspection at plant and in field.
 - 7. Division 03 "Concrete and Reinforcing Steel" Materials, inspection, concrete testing and bearing values.
 - 8. Division 03 "Insulating concrete Fill" Field inspection and testing.
 - 9. Division 03 "Precast Concrete" Materials, placement and testing.
 - 10. Division 04 "Unit Masonry" Sampling, laboratory testing and inspection in field.
 - 11. Division 04 "Cast Stone" Sampling and laboratory testing.
 - 12. Division 05 "Structural Steel" Inspection at shop and in field.
 - 13. Division 04 "Metal Decking and Forms" Inspection in field.
 - 14. Division 06 "Structural Timber" Inspection at fabrication plant and in field.
 - 15. Division 07 "Sprayed Fireproofing" Thickness, density and bond strength.

1.3 REFERENCE STANDARDS

- | | | |
|----|--------------|---|
| A. | ACI 318 | Building Code Requirements for Reinforced Concrete |
| B. | ACI 530.1-02 | Specification for Masonry Structures |
| C. | ASCE 6-02 | |
| D. | TMS 602-02 | |
| E. | AISC | Testing and Inspection Methods |
| F. | ANSI/ASTM | Tests for Thickness and Density of Sprayed Fire |
| G. | E 605 | Resistive Material Applied to Structural Members |
| H. | AOAC | Official Method of Analysis |
| I. | ASTM A 185 | Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement |
| J. | ASTM A 615 | Standard Specification for Deformed and Plain Billet Steel Bars for Concrete Reinforcement |
| K. | ASTM C 31 | Standard Specification for Making and Curing Concrete Test Specimens in the Field |
| L. | ASTM C 33 | Standard Specifications for Concrete Aggregates |
| M. | ASTM C 39 | Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens |
| N. | ASTM C 40 | Standard Test Method for Organic Impurities in Fine Aggregates for Concrete |
| O. | ASTM C 42 | Standard Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete |
| P. | ASTM C 67 | Method of Sampling and Testing Brick and Structural Clay Tile. |
| Q. | ASTM C 109 | Standard Test Method of Compressive Strength of Hydraulic Cement Mortars. |
| R. | ASTM C 140 | Method of Sampling and Testing Concrete Masonry Units |
| S. | ASTM C 143 | Standard Test Method for Slump of Hydraulic Cement Concrete |
| T. | ASTM C 270 | Mortar for Unit Masonry |
| U. | ASTM C 780 | Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry |

V.	ASTM C 1019	Method of Sampling and Testing Grout
W.	ASTM C 1194	Compression Testing of Cast Stone
X.	ASTM C 1195	Absorption Testing of Cast Stone
Y.	ASTM D 1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbs/ft ³).
Z.	ASTM D 4253	Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
AA.	ASTM E 84	Surface Burning Characteristics of Building Materials
BB.	ASTM E 119	Fire Tests of Building Construction and Materials
CC.	ASTM E 329	Practice for Use in the Evaluation of Testing and Inspection Agencies as Used in Construction
DD.	ASTM E 447	Standard Test Methods for Compressive Strength of Masonry Prisms
EE.	ASTM E 605	Thickness and Density of Sprayed Fire-Resistive Material Applied to Structural Members
FF.	ASTM E 736	Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
GG.	AWCI	Technical Manual 12-A, Second Edition - Standard Practice for the Testing and Inspection of Field Applied Sprayed Fire Resistive Materials
HH.	UL	Underwriters Laboratories Fire Resistance Directory.

1.4 QUALIFICATION OF LABORATORY

- A. Meet "Recommended Requirements for Independent Laboratory Qualification", published by American Council of Independent Laboratories.
- B. Meet basic requirements of ASTM E 329.
- C. Authorized to operate in the State of California.
- D. Testing and inspections shall be performed under the direction of Licensed Professional Engineer registered in the State of California who shall be responsible for administering all testing and inspections and shall certify any local agency requirements.
- E. Submit copy of report of inspection of facilities made by Materials Reference Laboratory of National Bureau of Standards during the most recent tour of inspection, with memorandum of remedies of any deficiencies reported by the inspection.
- F. Testing Equipment: Calibrated at reasonable intervals by devices of accuracy traceable to either:

1. National Bureau of Standards.
2. Accepted values of natural physical constants.

G. Special inspections shall meet the minimum qualifications listed below:

Special Inspector Qualifications		
<u>Category</u>	<u>Code Reference</u>	<u>Minimum Qualifications</u>
Reinforced Concrete	1704.4	<ol style="list-style-type: none"> 1. Current ICC Reinforced Concrete Special Inspector or ACI Concrete Construction Inspector. 2. Concrete field testing can be by an ACI Field Testing Technician with Grade 1 Certification. 3. Engineer-in-Training (EIT) with relevant experience. 4. Licensed Professional Engineer (P.E.) with relevant experience.
Prestressed Concrete	Table 1704.4; Items 8 & 10	<u>Pretension Tendons</u> <ol style="list-style-type: none"> 1. Current ICC Reinforced Concrete Certification and ICC prestressed concrete Certification ACI Concrete Field Testing Technician with Grade 1 Certification plus one year relevant experience. 2. Engineer-in-Training (EIT) with relevant experience. 3. Licensed Professional Engineer (P.E.) with relevant experience. <u>Post-tension Tendons</u> <ol style="list-style-type: none"> 1. Current Post-Tensioning Institute (PTI) Certification 2. Engineer-in-Training (EIT) with relevant experience. 3. Licensed Professional Engineer (P.E.) with relevant experience.
Welding	1704.3; Table 1704.3, Item 5; Table 1704.4, Item 2; 1707.2; 2208	<ol style="list-style-type: none"> 1. Current AWS Certified Welding Inspector. 2. Current ICC Structural Steel and Welding Certificate plus one year of relevant experience 3. Current Level II certification from the American Society for Nondestructive Testing (NDT) 4. Current NDT Level III provided previously certified as NDT Level II.
High-strength Bolting & Steel Frame Inspection	1704.3.3; Table 1704.3	<ol style="list-style-type: none"> 1. Current ICC Structural Steel and Welding certificate and one year of relevant experience.

		<ol style="list-style-type: none"> 2. Engineer-in-Training (EIT) with relevant experience. 3. Licensed Professional Engineer (P.E.) with relevant experience.
Masonry	1704.5; Table 1704.5.1; Table 1704.5.3	<ol style="list-style-type: none"> 1. Current ICC Structural Masonry certificate and one year of relevant experience. 2. Engineer-in-Training (EIT) with relevant experience. 3. Licensed Professional Engineer (P.E.) with relevant experience.
Sprayed Fire-Resistant Materials	1704.11	<ol style="list-style-type: none"> 1. Current ICC Spray-Applied Fireproofing certificate and one year of relevant experience. 2. Engineer-in-Training (EIT) with relevant experience. 3. Licensed Professional Engineer (P.E.) with relevant experience.
Excavation and Filling; Verification of Soils; Piling & Drilled Piers; Modular Retaining Walls	1704.7; 1704.8; 1704.9;	<ol style="list-style-type: none"> 1. Current Level II certification in geotechnical engineering technology/construction from the National Institute for Certification in Engineering Technologies (NICET). 2. Engineer-in-Training (EIT) with relevant experience. 3. Licensed Professional Engineer (P.E.) with relevant experience.
Inspection of Fabricators	1704.2	<ol style="list-style-type: none"> 1. Precast: Current ICC Reinforced Concrete plus one year relevant experience. 2. Bar Joist: see welding requirements. 3. Metal Building: see welding requirements. 4. Structural Steel: see welding requirements.
Exterior and Interior Architectural Wall Panels	1704.10	<ol style="list-style-type: none"> 1. Licensed Professional Engineer (P.E.) with relevant experience 2. Engineer-in-Training (EIT) with relevant experience 3. See the masonry requirements for the SI of masonry veneers subject to IBC Section 1704.10.
Exterior Insulation and Finish System	1704.12	<ol style="list-style-type: none"> 1. Architect with relevant experience.
Smoke Control	1704.14	<ol style="list-style-type: none"> 1. See the requirements in IBC Section 1704.14.2. 2. Licensed Engineer (P.E.) responsible for design.
Seismic Resistance	1707; 1708	<ol style="list-style-type: none"> 1. See the applicable categories in this table.

1.5 LABORATORY DUTIES

- A. Cooperate with Architect and Contractor; provide qualified personnel after due notice.
- B. Perform specified inspections, sampling and testing of materials and methods of construction:
 - 1. Comply with specified standards.
 - 2. Ascertain compliance of materials with requirements of Contract Documents.
- C. If during the excavation for foundations, materials are encountered which vary from those indicated by the test boring data or the Contract Documents or if there are any unusual conditions observed when concrete for foundations is placed, the Inspection Agency or Geotechnical Engineer shall IMMEDIATELY advise the Owner to stop all related work until the Architect has been notified of such conditions.
- D. Should any material be delivered to the site which does not conform to the requirements of the Contract Documents, the Inspection Agency and Geotechnical Engineer shall have the authority to reject such material and shall IMMEDIATELY notify the Owner, Contractor and Architect of such rejection.
- E. Should Laboratory tests of material performed at specified intervals of time indicate that strengths do not meet Specification requirements, the Inspection Agency and Geotechnical Engineer shall IMMEDIATELY notify the Owner, Contractor and Architect. The Architect shall determine whether remedial action is necessary.
- F. Promptly submit written report of each test and inspection; two copies each to Architect, Owner, and Contractor. Each report shall include:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Testing laboratory name, address and telephone number.
 - 4. Name and signature of laboratory inspector.
 - 5. Date and time of sampling or inspection.
 - 6. Record of temperature and weather conditions.
 - 7. Date of test.
 - 8. Identification of product and Specification section.
 - 9. Type of inspection or test.
 - 10. Results of tests and compliance with Contract Documents.
 - 11. Interpretation of test results.
- G. Prepare a summary report for each category of inspection certifying that the work has been inspected and meets the Contract Documents. Specifically list all discrepancies found which have not yet been repaired or resolved.
- H. Perform additional tests as required by Architect or the Owner.

1.6 SPECIAL INSPECTOR RESPONSIBILITIES

- A. Establish and maintain appropriate communications with the Owner, Architect/Engineer, the Contractor, and the Building Official regarding the Special Inspection process

- B. Perform all tests and inspections required by the Statement of Special Inspections.
- C. Review inspection and testing reports and bring discrepancies to the attention of the Contractor and to the Prime Design Professional and Structural Engineer of Record as required.
- D. Distribute periodic interim reports to the Building Official, Architect/Engineer, Contractor, and the Owner as the work progresses. Reports for items requiring action should be distributed immediately.
- E. Monitor the work of the Contractor to assess actions required to correct deficiencies reported in Special Inspection reports.
- F. Prepare a Final Report of Special Inspections and submit it to the Building Official, upon completion of construction, stating that the Special Inspections were completed, and that all discrepancies have been corrected.

1.7 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY AND GEOTECHNICAL ENGINEERING CONSULTANT

- A. Laboratory or Geotechnical Engineer is not authorized to:
 - 1. Release, revoke, alter or enlarge on requirements of Contract Documents.
 - 2. Approve or accept any portion of the Work.
 - 3. Perform any duties of the Contractor.

1.8 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with Testing Laboratory and Geotechnical Engineer, provide access to Work.
- B. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which are required to be tested.
- C. Provide to the laboratory the preliminary and final design mixes proposed to be used for concrete and other materials mixes which are required to be controlled by the testing laboratory.
- D. Furnish copies of Products test reports as required.
- E. Furnish incidental labor and facilities:
 - 1. To provide access to Work to be tested.
 - 2. To obtain and handle samples at the Project site or at the source of the product to be tested.
 - 3. To facilitate inspections and tests.
 - 4. For storage and curing of test samples.
- F. Notify Testing Agency, Geotechnical Engineer and Architect sufficiently in advance of operations to allow for assignment of personnel and scheduling of tests. Notification shall be a minimum of three working days (72 hours) for required shop testing and two working days (48 hours) for required field testing. When tests or inspections cannot be performed after such

notice, reimburse Owner for testing personnel and travel expenses incurred due to Contractor's negligence.

G. Make arrangements with laboratory and pay for additional samples and tests required:

1. When initial test indicates work does not comply with Contract Documents.
2. For the Contractor's convenience.
3. For inspection and testing services required, but not included herein.

1.9 SPECIFIC TESTS, INSPECTIONS BY OWNER'S AGENCY

A. Inspection and monitoring storm water runoff from site (Division 31)

1. Inspect erosion and sediment control installation measures.
2. Monitor throughout the construction period to verify the appropriate effectiveness of the erosion and sediment control measures.

B. Testing and Inspection of Earthwork (Division 31)

1. Inspect and test compaction under interior building floor slabs-on-grade.
2. These areas shall be compacted to a minimum of 95% modified density at optimum moisture content per ASTM D 1557.
3. Tests shall be made at 12 inch vertical increments at critical locations as determined by the Geotechnical Engineer.
4. Perform a minimum of one test per 400 square feet of area filled.
5. Inspect and test compaction throughout the site under both paved areas and under landscaped/grassed areas. Refer to subsurface investigation for required compaction values. Inspect and verify suitability of both on site and off site soil proposed to be used as fill material.
6. All compaction tests shall be performed by the Testing and Inspection Agency.

C. Inspection and Tests for Topsoil (Division 31)

1. Inspect on site topsoil after mixing on the site.
2. Inspect off site material at the place of mixing.
3. Provide the services of a soil specialist to provide the following test report information of on-site topsoil and off-site topsoil:
 - a. Test reports shall contain specific requirements to the exact types, time and rates of application of soil additives and fertilizer based upon the soil test results and type of material to be planted. Analysis shall include:
 - 1) pH factor
 - 2) Percent organic content
 - 3) Soluble salts
 - 4) Available nutrients Percent clay, silt and sand particles
 - 5) Percent clay, silt and sand particles
 - b. Requirements shall include type, composition rate and means of application of soil additive and fertilizer necessary to establish satisfactory pH factor and supply of nutrients satisfactory for planting.

4. Perform all testing in accordance with the current methods of the Association of Officials of Analytical Chemists (AOAC).

D. Testing and Inspection of Caissons (Division 31)

1. Perform sampling, testing and inspection in connection with materials entering into caisson work.
2. Geotechnical Engineer will inspect caisson bottoms and vertical alignment of caissons, certify that the bearing value and side friction value of strata meets the design requirements, and record actual elevation of top and bottom of caisson and actual dimensions.
3. Check placement of reinforcing steel.
4. For test purposes make five cylinders from each day's pour or each 100 cubic yards, whichever is less, per ASTM C 31; test two cylinders at 7 days and test three cylinders at 28 days, per ASTM C 39; minimum strength of 7-day tests shall be 75% of design concrete strength.
5. Contractor will notify Inspection Agency and Geotechnical Engineer a minimum of 48 hours in advance when caisson bottoms are ready for inspection.

E. Inspection and Testing for Asphaltic Concrete Paving (Division 31)

1. Stone Base Testing and Inspection
 - a. Analyses of random loose samples.
 - b. Compaction testing of material in place.
 - c. Monitoring of material depth.
2. Inspection and Testing of Bituminous Paving
 - a. Analyses of random loose samples.
 - b. Extraction and analysis of cores removed in the field.
 - c. Monitoring of material depth.

F. Testing and Inspection of Poured in Place Concrete Work (Division 03)

1. Review proposed mix design of each class of concrete prior to commencement of concrete work.
2. Perform testing and inspection of concrete and materials entering into mixing and placing of concrete. This shall include cement, aggregate and reinforcing steel and other materials used in concrete.
3. Geotechnical Engineer will inspect footing bottoms and certify that the bearing value of the strata meets the design requirements.
4. Maintain an inspector on job site at all times when concrete is being placed. He shall make cylinders, slump tests, air content tests, inspect forms for conformity to the Contract Documents with regard to shape and dimensions of concrete elements, and location of construction joints and reinforcement for size, quantity, spacing, correct concrete coverage, and location of splices and shall have authority to reject concrete delivered to the site if it does not conform to Specifications. He shall also make periodic inspections of ready-mix plant supplying concrete.
5. Cement shall be tested as prescribed in applicable reference Specification under which it is furnished.

6. Aggregate shall be tested per ASTM C 33; in addition, fine aggregate shall be tested for organic impurities per ASTM C 40.
7. Reinforcing bars shall be tested per ASTM A 615. Mesh reinforcement shall be tested per ASTM A 185. Installation shall be inspected for compliance with Contract Documents.
8. Strength Tests of Concrete Cylinder During Work: For test purposes provide material for one set of five cylinders taken from each 100 cubic yards or fraction thereof, or each day's pour, whichever is less, of each class of concrete placed, per ASTM C 31. Test two cylinders at 7 days and three at 28 days, per ASTM C 39. Minimum strength of 7 day tests shall be 75% of design concrete strength.
9. Make slump tests in field per ASTM C 143 to check consistency of concrete as delivered. As a minimum, make tests at same frequency as test cylinders for compressive tests. Make additional tests at discretion of Inspection Agency to assure uniformity of concrete.
10. Tests of Hardened Concrete in, or Removed From, Structures
 - a. Where there is question as to quality of concrete in structure, the Architect may require tests per ASTM C 42, or order load tests for that portion of structure where questionable concrete has been placed.
 - b. Where required, load test shall be made at Contractor's expense, per Section 202 of ACI 318.
 - c. In event that load tests or test per ASTM C 42 indicate that concrete placed does not conform to Contract Documents take measures as prescribed by the Architect to correct deficiency at no additional expense to the Owner.

G. Testing and Inspection of Insulating Concrete Fill (Division 03)

1. Density of insulating concrete fill shall be checked hourly at point of placement.
2. Test compressive strength 4 separate times for each day's pour in accordance with ASTM C 495.

H. Testing and Inspection of Structural and Architectural Precast Concrete Work (Division 03)

1. Perform inspection of precast concrete production. Inspection shall include review of quality control procedures for concrete, cement, aggregate, reinforcing steel, prestressing strands and other materials used in the production of precast concrete members.
2. Testing and Inspection Agency shall perform sampling and testing of concrete, cement and aggregate collected at the precast concrete manufacturer's plant. These tests are in addition to the quality control by the precast manufacturer.
3. Test cylinders shall be taken during production; cure specimens using same methods used for precast concrete units until units are stripped, then moist cure specimens are tested in accordance with ACI and PCI standards. Four (4) standard size concrete test cylinders will be made; 2 will be broken at 7 days and 2 at 28 days.
4. Inspection Agency shall also inspect erection and field connections of precast concrete hollow core plank units.
5. Inspection Agency shall inspect and provide written certification that reinforcing and embedded connection detail materials have been fabricated and positioned in the exact manner indicated on the shop drawings. Should any question arise regarding such reinforcing and embedded material, Contractor shall be required to provide verification by other recognized methods, such as x-ray or ultrasonic methods, as reviewed by the Architect. Precast manufacturing plant shall provide free and safe access to work at all

times, in plant and in field, to the Architect and the Inspection Agency, for proper inspection and testing of work.

I. Testing and Inspection of Masonry (Division 04)

1. Perform sampling, testing and inspection in connection with the quality of masonry units, mortar and grout and materials entering into masonry mortar, grout and concrete fill, including cement, aggregates, lime, water and reinforcing in accordance with tests referenced in Specifications for Masonry Structures ACI 530.1-02/ASCE 6-02/TMS 602-02.
2. Review mix designs for masonry mortars, grouts and concrete.
3. Perform visual inspection in the field of the masonry units, reinforcing, proportioning mixing and consistency of mortars and grout, and general compliance with the Contract Documents.

J. Testing and Inspection of Cast Stone Units (Division 04)

1. Perform sampling and testing in connection with the quality of cast stone in accordance with ASTM C 1194 and ASTM C 1195.
2. Compression Test: Select one sample from each 500 cf of cured cast stone of adequate size to permit preparation of three 2 inch cube specimens; condition and test each in accordance with ASTM C 1194, calculate and report compressive strength.
3. Absorption Test: Select one additional sample from each 500 cf of cured cast stone of adequate size to permit preparation of three 2 inch cube specimens; condition and test each by the cold water procedure in accordance with ASTM C 1195, calculate and report absorption.

K. Testing and Inspection of Structural Steel (Division 05)

1. Perform all shop and field tests and inspection in connection with all structural steel work. This shall include the shop and field inspection of structural steel work and the shop and field inspection and testing of all structural steel and connections.
2. Inspection shall consist of checking bolted connections; checking of field welding (visual); checking the plumb of steel; and when required a check of shop and field welding using either X-ray or ultrasonic equipment as specified herein.
3. Perform all inspection work under direction of a Registered Professional Engineer; the Inspector must be experienced in the testing and inspection procedures of the AISC and pertinent ASTM Specifications.
4. Inspection of Welds: Inspect all full penetration welds using X-ray or ultrasonic methods. Inspect 50% of all partial penetration welds by a nondestructive method at the discretion of the Inspection Agency. Inspect 25% of all fillet welds by a nondestructive method at the discretion of the Inspection Agency. Any improper welding shall be corrected by the Contractor and tested by the Inspection Agency at no expense to the Owner.
 - a. Any improper welding found shall be corrected by the Contractor and an additional 15% of the welds shall be tested by the Owner's Inspection Agency at no expense to the Owner.
 - b. If a disproportionate number of improper welds (5%) occurs in the additional 15% tested, all welding operations shall be halted temporarily and not resumed until welding procedures are reviewed and corrected by the Contractor and accepted by

the Architect and the Owner's Inspection Agency. All corrective work and testing shall be at the Contractor's expense.

5. Inspection of Bolted Connections

- a. High strength bolts will not be permitted in the "snug tight" condition. All high tensile bolts must be torqued to specified value as noted in AISC Specification for Structural Joints (4/26/78).
- b. For high strength bolts in bearing type connections installed with a prescribed pretension, inspection shall include a visual examination of all bolts, plus a check by use of a calibrated torque wrench on at least 15% of bolts (minimum 2 bolts) in each particular connection. If any bolt tested does not meet the Specification requirements, all bolts in the connection shall be retightened and retested.
- c. All corrective work and additional testing shall be at the Contractor's expense.

L. Testing and Inspection of Metal Decking and Forms (Division 05)

1. Perform all field inspection in connection with the installation of the metal decking and forms.
2. Inspection shall consist of visual checking of the installation and field welding of metal deck and forms to the supporting structural steel framing including bearing plates and angles and other miscellaneous supports.
3. Inspection shall also consist of visual checking of the installation and attachment of metal screeds, forms and closure plates.

M. Testing and Inspection of Miscellaneous Metal (Division 05)

1. Perform select shop and field tests and inspection in connection with Miscellaneous Metals work and connections.
2. Inspection shall consist of checking bolted connections; checking of field welding (visual); checking the fit-up of steel; and when required a check of shop and field welding using either X-ray or ultrasonic equipment as specified herein.
3. Perform all inspection work under direction of a Registered Professional Engineer; the Inspector must be experienced in the testing and inspection procedures of the AISC and pertinent ASTM Specifications.
4. Inspection of Welds:
 - a. Full Penetration Welds: Inspect all full penetration welds using X-ray or ultrasonic methods.
 - b. Partial Penetration Welds: Inspect 50% of all partial penetration welds by a nondestructive method at the discretion of the Inspection Agency.
 - c. Primary Fillet Welds: Inspect 25% of all fillet welds used for connections of channels, angles, or load carrying members by a nondestructive method at the discretion of the Inspection Agency.
 - d. Secondary Fillet welds: Inspect 15% of all fillet welds used for connections of handrails by a nondestructive method at the discretion of the Inspection Agency. Inspect 10% of all fillet welds used for connections of grating or secondary components by a nondestructive method at the discretion of the Inspection Agency.
 - e. Any improper welding found shall be corrected by the Contractor and an additional 15% of the welds shall be tested by the Owner's Inspection Agency at no expense to the Owner. If a disproportionate number of improper welds (5%) occurs in the

additional 15% tested, all welding operations shall be halted temporarily and not resumed until welding procedures are reviewed and corrected by the Contractor and accepted by the Architect and the Owner's Inspection Agency. All corrective work and testing shall be at the Contractor's expense.

N. Testing and Inspection of Structural Timber (including prefabricated timber trusses and joists) (Division 06)

1. Perform periodic inspections at the prefabricated truss and joists fabrication plant.
2. Perform visual inspection in the field in connection with the installation of the prefabricated trusses and joists and their connections to other elements.

O. Testing and Inspection of Sprayed Fireproofing (Division 07)

1. Verify applied thickness and applied density of sprayed fireproofing for conformity to the fire rating requirements of UL Design Numbers indicated, and verify that installation meets reviewed test reports for the following: for bond strength (adhesion) of fireproofing; for fireproofing application to substrate materials similar to conditions expected on the project; and for product proposed for use indicating conformance to ASTM E 119 and ASTM E 84.
2. Conduct testing in accordance with ASTM E 605, ASTM E 736 and AWCI standards. Submit test results to Owner, Architect and Contractor.
3. Thickness Measurement and Acceptance Criteria
 - a. Inspect 25% of the structural frame (columns and beams) in each story for thickness determination.
 - b. Inspect 10% of beams (other than structural frame members) selected at random, for thickness determination.
 - c. Take floor thickness measurements, where required, on a random basis; one test per 10,000 square feet of floor area or fraction thereof; minimum of two tests per floor regardless of floor area.
 - d. Average thickness shall not be less than required, in inches, subject to a tolerance of $\pm 1/4$ inch or 25% of the thickness specified in the fire resistance rating design criteria. Measurements greater than $1/4$ inch above the required shall not be used to determine the thickness average.
4. Density Measurement and Acceptance Criteria
 - a. Take density test specimens from a column, and a beam and the deck for each 10,000 square feet of floor area or fraction thereof; minimum of two tests per floor, regardless of floor area.
 - b. No density sample shall have a density less than that specified or required by the UL fire resistance rating design number.
5. Bond Strength Measurement and Acceptance Criteria
 - a. Conduct test on material from areas adjacent to test sections where thickness and density determinations have been made.
 - b. One test shall be conducted for beams and one test for decks] for each 10,000 square feet of floor area, with a minimum of two tests per floor regardless of floor area.

- c. Minimum acceptable bond strength shall be 200 psf.
- 6. Testing laboratory shall submit certification in the format included with this section; certify that each structural member conforms to the minimum requirements for the approved UL design.
- 7. Contractor shall correct unacceptable work and pay for further testing (by Owner's Testing Agency) required to prove acceptability of installation.

END OF SECTION 01 41 00

SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 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.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.
- J. The word CONCEALED shall be understood as referring to Work contained within building floors, walls or partitions; Work installed in the space between any type of suspended ceiling and the structural floor or roof above; Work installed within a structural shaft, chase or column; and other Work installed so as to be hidden from view.

- K. The word EXPOSED shall be understood as referring to Work installed external to building floors, walls or partitions; Work installed in a room or space where any type of suspended ceiling is not specified; Work installed in penthouses, mechanical rooms and electrical rooms of all types; and all other Work installed so as to be exposed to view.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.
- D. Abbreviations and Acronyms for Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the organizations responsible for the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities Available from Access Board www.access-board.gov	(800) 872-2253 (202) 272-0080
CFR	Code of Federal Regulations Available from Government Printing Office www.gpoaccess.gov/cfr/index.html	(866) 512-1800 (202) 512-1800
DOD	Department of Defense Military Specifications and Standards Available from Department of Defense Single Stock Point http://dodssp.daps.dla.mil	(215) 697-6257
DSCC	Defense Supply Center Columbus (See FS)	
FED-STD	Federal Standard (See FS)	
FS	Federal Specification	(215) 697-6257

Available from Department of Defense Single Stock Point
<http://dodssp.daps.dla.mil>

Available from Defense Standardization Program
www.dps.dla.mil

Available from General Services Administration (202) 619-8925
www.gsa.gov

Available from National Institute of Building Sciences (202) 289-7800
www.nibs.org

FTMS Federal Test Method Standard
(See FS)

MIL (See MILSPEC)

MIL-STD (See MILSPEC)

MILSPEC Military Specification and Standards (215) 697-6257
Available from Department of Defense Single Stock Point
<http://dodssp.daps.dla.mil>

UFAS Uniform Federal Accessibility Standards (800) 872-2253
Available from Access Board (202) 272-0080
www.access-board.gov

1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

AA Aluminum Association, Inc. (The) (703) 358-2960
www.aluminum.org

AAADM American Association of Automatic Door Manufacturers (216) 241-7333
www.aaadm.com

AABC Associated Air Balance Council (202) 737-0202
www.aabchq.com

AAMA American Architectural Manufacturers Association (847) 303-5664
www.aamanet.org

AASHTO American Association of State Highway and Transportation Officials (202) 624-5800
www.transportation.org

AATCC	American Association of Textile Chemists and Colorists (The) www.aatcc.org	(919) 549-8141
ABAA	Air Barrier Association of America www.airbarrier.org	(866) 956-5888
ABMA	American Bearing Manufacturers Association www.abma-dc.org	(202) 367-1155
ACI	ACI International (American Concrete Institute) www.aci-int.org	(248) 848-3700
ACPA	American Concrete Pipe Association www.concrete-pipe.org	(972) 506-7216
AEIC	Association of Edison Illuminating Companies, Inc. (The) www.aeic.org	(205) 257-2530
AF&PA	American Forest & Paper Association www.afandpa.org	(800) 878-8878 (202) 463-2700
AGA	American Gas Association www.aga.org	(202) 824-7000
AGC	Associated General Contractors of America (The) www.agc.org	(703) 548-3118
AHA	American Hardboard Association (Now part of CPA)	
AHAM	Association of Home Appliance Manufacturers www.aham.org	(202) 872-5955
AI	Asphalt Institute www.asphaltinstitute.org	(859) 288-4960
AIA	American Institute of Architects (The) www.aia.org	(800) 242-3837 (202) 626-7300
AISC	American Institute of Steel Construction www.aisc.org	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute www.steel.org	(202) 452-7100
AITC	American Institute of Timber Construction www.aitc-glulam.org	(303) 792-9559

ALCA	Associated Landscape Contractors of America (Now PLANET - Professional Landcare Network)	
ALSC	American Lumber Standard Committee, Incorporated www.alsc.org	(301) 972-1700
AMCA	Air Movement and Control Association International, Inc. www.amca.org	(847) 394-0150
ANSI	American National Standards Institute www.ansi.org	(202) 293-8020
AOSA	Association of Official Seed Analysts, Inc. www.aosaseed.com	(505) 522-1437
APA	APA - The Engineered Wood Association www.apawood.org	(253) 565-6600
APA	Architectural Precast Association www.archprecast.org	(239) 454-6989
API	American Petroleum Institute www.api.org	(202) 682-8000
ARI	Air-Conditioning & Refrigeration Institute www.ari.org	(703) 524-8800
ARMA	Asphalt Roofing Manufacturers Association www.asphaltroofing.org	(202) 207-0917
ASCE	American Society of Civil Engineers www.asce.org	(800) 548-2723 (703) 295-6300
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers www.ashrae.org	(800) 527-4723 (404) 636-8400
ASME	ASME International (The American Society of Mechanical Engineers International) www.asme.org	(800) 843-2763 (973) 882-1170
ASSE	American Society of Sanitary Engineering www.asse-plumbing.org	(440) 835-3040
ASTM	ASTM International (American Society for Testing and Materials International) www.astm.org	(610) 832-9585
AWCI	AWCI International (Association of the Wall and Ceiling Industry International)	(703) 534-8300

www.awci.org

AWCMA	American Window Covering Manufacturers Association (Now WCSC)	
AWI	Architectural Woodwork Institute www.awinet.org	(800) 449-8811 (703) 733-0600
AWPA	American Wood-Preservers' Association www.awpa.com	(334) 874-9800
AWS	American Welding Society www.aws.org	(800) 443-9353 (305) 443-9353
AWWA	American Water Works Association www.awwa.org	(800) 926-7337 (303) 794-7711
BHMA	Builders Hardware Manufacturers Association www.buildershardware.com	(212) 297-2122
BIA	Brick Industry Association (The) www.bia.org	(703) 620-0010
BICSI	BICSI www.bicsi.org	(800) 242-7405 (813) 979-1991
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International) www.bifma.com	(616) 285-3963
BISSC	Baking Industry Sanitation Standards Committee www.bissc.org	(866) 342-4772
CCC	Carpet Cushion Council www.carpetcushion.org	(203) 637-1312
CDA	Copper Development Association www.copper.org	(800) 232-3282 (212) 251-7200
CEA	Canadian Electricity Association www.canelect.ca	(613) 230-9263
CFFA	Chemical Fabrics & Film Association, Inc. www.chemicalfabricsandfilm.com	(216) 241-7333
CGA	Compressed Gas Association www.cganet.com	(703) 788-2700
CIMA	Cellulose Insulation Manufacturers Association	(888) 881-2462

	www.cellulose.org	(937) 222-2462
CISCA	Ceilings & Interior Systems Construction Association www.cisca.org	(630) 584-1919
CISPI	Cast Iron Soil Pipe Institute www.cispi.org	(423) 892-0137
CLFMI	Chain Link Fence Manufacturers Institute www.chainlinkinfo.org	(301) 596-2583
CPA	Composite Panel Association www.pbmdf.com	(301) 670-0604
CPPA	Corrugated Polyethylene Pipe Association www.cppa-info.org	(800) 510-2772 (202) 462-9607
CRI	Carpet & Rug Institute (The) www.carpet-rug.com	(800) 882-8846 (706) 278-3176
CRSI	Concrete Reinforcing Steel Institute www.crsi.org	(847) 517-1200
CSA	CSA International (Formerly: IAS - International Approval Services) www.csa-international.org	(866) 797-4272 (416) 747-4000
CSI	Cast Stone Institute www.caststone.org	(770) 972-3011
CSI	Construction Specifications Institute (The) www.csinet.org	(800) 689-2900 (703) 684-0300
CSSB	Cedar Shake & Shingle Bureau www.cedarbureau.org	(604) 820-7700
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute) www.cti.org	(281) 583-4087
DHI	Door and Hardware Institute www.dhi.org	(703) 222-2010
EIA	Electronic Industries Alliance www.eia.org	(703) 907-7500
EIMA	EIFS Industry Members Association www.eima.com	(800) 294-3462 (770) 968-7945
EJCDC	Engineers Joint Contract Documents Committee	(703) 295-5000

	www.ejdc.org	
EJMA	Expansion Joint Manufacturers Association, Inc. www.ejma.org	(914) 332-0040
ESD	ESD Association www.esda.org	(315) 339-6937
FIBA	Federation Internationale de Basketball Amateur (The International Basketball Federation) www.fiba.com	41 22 545 00 00
FIVB	Federation Internationale de Volleyball (The International Volleyball Federation) www.fivb.ch	41 21 345 35 35
FMG	FM Global (Formerly: FM - Factory Mutual System) www.fmglobal.com	(401) 275-3000
FMRC	Factory Mutual Research (Now FMG)	
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc. www.floridarooof.com	(407) 671-3772
FSA	Fluid Sealing Association www.fluidsealing.com	(610) 971-4850
FSC	Forest Stewardship Council www.fsc.org	49 228 367 66 0
GA	Gypsum Association www.gypsum.org	(202) 289-5440
GANA	Glass Association of North America www.glasswebsite.com	(785) 271-0208
GRI	(Now GSI)	
GS	Green Seal www.greenseal.org	(202) 872-6400
GSI	Geosynthetic Institute www.geosynthetic-institute.org	(610) 522-8440
HI	Hydraulic Institute www.pumps.org	(888) 786-7744 (973) 267-9700

HI	Hydronics Institute www.gamanet.org	(908) 464-8200
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)	
HPVA	Hardwood Plywood & Veneer Association www.hpva.org	(703) 435-2900
HPW	H. P. White Laboratory, Inc. www.hpwhite.com	(410) 838-6550
IAS	International Approval Services (Now CSA International)	
IBF	International Badminton Federation www.intbadfed.org	(6-03) 9283-7155
ICEA	Insulated Cable Engineers Association, Inc. www.icea.net	(770) 830-0369
ICRI	International Concrete Repair Institute, Inc. www.icri.org	(847) 827-0830
IEC	International Electrotechnical Commission www.iec.ch	41 22 919 02 11
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The) www.ieee.org	(212) 419-7900
IESNA	Illuminating Engineering Society of North America www.iesna.org	(212) 248-5000
IEST	Institute of Environmental Sciences and Technology www.iest.org	(847) 255-1561
IGCC	Insulating Glass Certification Council www.igcc.org	(315) 646-2234
IGMA	Insulating Glass Manufacturers Alliance www.igmaonline.org	(613) 233-1510
ILI	Indiana Limestone Institute of America, Inc. www.iliai.com	(812) 275-4426
ISO	International Organization for Standardization www.iso.ch	41 22 749 01 11
	Available from ANSI www.ansi.org	(202) 293-8020

ISSFA	International Solid Surface Fabricators Association www.issfa.net	(877) 464-7732 (702) 567-8150
ITS	Intertek www.intertek.com	(800) 345-3851 (713) 407-3500
ITU	International Telecommunication Union www.itu.int/home	41 22 730 51 11
KCMA	Kitchen Cabinet Manufacturers Association www.kcma.org	(703) 264-1690
LMA	Laminating Materials Association (Now part of CPA)	
LPI	Lightning Protection Institute www.lightning.org	(800) 488-6864 (804) 314-8955
MBMA	Metal Building Manufacturers Association www.mbma.com	(216) 241-7333
MFMA	Maple Flooring Manufacturers Association, Inc. www.maplefloor.org	(847) 480-9138
MFMA	Metal Framing Manufacturers Association www.metalframingmfg.org	(312) 644-6610
MH	Material Handling (Now MHIA)	
MHIA	Material Handling Industry of America www.mhia.org	(800) 345-1815 (704) 676-1190
MIA	Marble Institute of America www.marble-institute.com	(440) 250-9222
MPI	Master Painters Institute www.paintinfo.com	(888) 674-8937
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc. www.mss-hq.com	(703) 281-6613
NAAMM	National Association of Architectural Metal Manufacturers www.naamm.org	(312) 332-0405
NACE	NACE International (National Association of Corrosion Engineers International) www.nace.org	(800) 797-6623 (281) 228-6200

NADCA	National Air Duct Cleaners Association www.nadca.com	(202) 737-2926
NAGWS	National Association for Girls and Women in Sport www.aahperd.org/nagws/	(800) 213-7193, ext. 453
NAIMA	North American Insulation Manufacturers Association www.naima.org	(703) 684-0084
NBGQA	National Building Granite Quarries Association, Inc. www.nbgqa.com	(800) 557-2848
NCAA	National Collegiate Athletic Association (The) www.ncaa.org	(317) 917-6222
NCMA	National Concrete Masonry Association www.ncma.org	(703) 713-1900
NCPI	National Clay Pipe Institute www.ncpi.org	(262) 248-9094
NCTA	National Cable & Telecommunications Association www.ncta.com	(202) 775-3550
NEBB	National Environmental Balancing Bureau www.nebb.org	(301) 977-3698
NECA	National Electrical Contractors Association www.necanet.org	(301) 657-3110
NeLMA	Northeastern Lumber Manufacturers' Association www.nelma.org	(207) 829-6901
NEMA	National Electrical Manufacturers Association www.nema.org	(703) 841-3200
NETA	InterNational Electrical Testing Association www.netaworld.org	(888) 300-6382 (303) 697-8441
NFHS	National Federation of State High School Associations www.nfhs.org	(317) 972-6900
NFPA	NFPA (National Fire Protection Association) www.nfpa.org	(800) 344-3555 (617) 770-3000
NFRC	National Fenestration Rating Council www.nfrc.org	(301) 589-1776

NGA	National Glass Association www.glass.org	(866) 342-5642 (703) 442-4890
NHLA	National Hardwood Lumber Association www.natlhardwood.org	(800) 933-0318 (901) 377-1818
NLGA	National Lumber Grades Authority www.nlga.org	(604) 524-2393
NOFMA	NOFMA: The Wood Flooring Manufacturers Association (Formerly: National Oak Flooring Manufacturers Association) www.nofma.org	(901) 526-5016
NRCA	National Roofing Contractors Association www.nrca.net	(800) 323-9545 (847) 299-9070
NRMCA	National Ready Mixed Concrete Association www.nrmca.org	(888) 846-7622 (301) 587-1400
NSF	NSF International (National Sanitation Foundation International) www.nsf.org	(800) 673-6275 (734) 769-8010
NSSGA	National Stone, Sand & Gravel Association www.nssga.org	(800) 342-1415 (703) 525-8788
NTMA	National Terrazzo & Mosaic Association, Inc. (The) www.ntma.com	(800) 323-9736 (540) 751-0930
NTRMA	National Tile Roofing Manufacturers Association (Now TRI)	
NWWDA	National Wood Window and Door Association (Now WDMA)	
OPL	Omega Point Laboratories, Inc. (Acquired by ITS - Intertek) www.opl.com	(800) 966-5253 (210) 635-8100
PCI	Precast/Prestressed Concrete Institute www.pci.org	(312) 786-0300
PDCA	Painting & Decorating Contractors of America www.pdca.com	(800) 332-7322 (314) 514-7322
PDI	Plumbing & Drainage Institute www.pdionline.org	(800) 589-8956 (978) 557-0720
PGI	PVC Geomembrane Institute http://pgi-tp.ce.uiuc.edu	(217) 333-3929

PLANET	Professional Landcare Network (Formerly: ACLA - Associated Landscape Contractors of America) www.landcarenetwork.org	(800) 395-2522 (703) 736-9666
PTI	Post-Tensioning Institute www.post-tensioning.org	(602) 870-7540
RCSC	Research Council on Structural Connections www.boltcouncil.org	(800) 644-2400 (312) 670-2400
RFCI	Resilient Floor Covering Institute www.rfci.com	(301) 340-8580
RIS	Redwood Inspection Service www.calredwood.org	(888) 225-7339 (415) 382-0662
RTI	(Formerly: NTRMA - National Tile Roofing Manufacturers Association) (Now TRI)	
SAE	SAE International www.sae.org	(877) 606-7323 (724) 776-4841
SDI	Steel Deck Institute www.sdi.org	(847) 458-4647
SDI	Steel Door Institute www.steeldoor.org	(440) 899-0010
SEFA	Scientific Equipment and Furniture Association www.sefalabs.com	(516) 294-5424
SGCC	Safety Glazing Certification Council www.sgcc.org	(315) 646-2234
SIA	Security Industry Association www.siaonline.org	(703) 683-2075
SIGMA	Sealed Insulating Glass Manufacturers Association (Now IGMA)	
SJI	Steel Joist Institute www.steeljoist.org	(843) 626-1995
SMA	Screen Manufacturers Association www.smacentral.org	(561) 533-0991
SMACNA	Sheet Metal and Air Conditioning Contractors'	(703) 803-2980

	National Association www.smacna.org	
SMPTE	Society of Motion Picture and Television Engineers www.smpte.org	(914) 761-1100
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division) www.sprayfoam.org	(800) 523-6154
SPIB	Southern Pine Inspection Bureau (The) www.spib.org	(850) 434-2611
SPRI	Single Ply Roofing Industry www.spri.org	(781) 647-7026
SSINA	Specialty Steel Industry of North America www.ssina.com	(800) 982-0355 (202) 342-8630
SSPC	SSPC: The Society for Protective Coatings www.sspc.org	(877) 281-7772 (412) 281-2331
STI	Steel Tank Institute www.steeltank.com	(847) 438-8265
SWI	Steel Window Institute www.steelwindows.com	(216) 241-7333
SWRI	Sealant, Waterproofing, & Restoration Institute www.swrionline.org	(816) 472-7974
TCA	Tile Council of America, Inc. www.tileusa.com	(864) 646-8453
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance www.tiaonline.org	(703) 907-7700
TMS	The Masonry Society www.masonrysociety.org	(303) 939-9700
TPI	Truss Plate Institute, Inc. www.tpinst.org	(703) 683-1010
TPI	Turfgrass Producers International www.turfgrassod.org	(847) 649-5555
TRI	Tile Roofing Institute (Formerly: RTI - Roof Tile Institute)	(312) 670-4177

	www.tilerroofing.org	
UL	Underwriters Laboratories Inc. www.ul.com	(877) 854-3577 (847) 272-8800
UNI	Uni-Bell PVC Pipe Association www.uni-bell.org	(972) 243-3902
USAV	USA Volleyball www.usavolleyball.org	(888) 786-5539 (719) 228-6800
USGBC	U.S. Green Building Council www.usgbc.org	(202) 828-7422
USITT	United States Institute for Theatre Technology, Inc. www.usitt.org	(800) 938-7488 (315) 463-6463
WASTEC	Waste Equipment Technology Association www.wastec.org	(800) 424-2869 (202) 244-4700
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org	(800) 283-1486 (503) 639-0651
WCMA	Window Covering Manufacturers Association (Now WCSC)	
WCSC	Window Covering Safety Council (Formerly: WCMA - Window Covering Manufacturers Association) www.windowcoverings.org	(800) 506-4636 (212) 297-2109
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association) www.wdma.com	(800) 223-2301 (847) 299-5200
WI	Woodwork Institute (Formerly: WIC - Woodwork Institute of California) www.wicnet.org	(916) 372-9943
WIC	Woodwork Institute of California (Now WI)	
WMMPA	Wood Moulding & Millwork Producers Association www.wmmpa.com	(800) 550-7889 (530) 661-9591
WSRCA	Western States Roofing Contractors Association www.wsrca.com	(800) 725-0333 (650) 570-5441
WWPA	Western Wood Products Association	(503) 224-3930

- B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

BOCA BOCA International, Inc.
(See ICC)

IAPMO International Association of Plumbing and Mechanical Officials (909) 472-4100
www.iapmo.org

ICBO International Conference of Building Officials
(See ICC)

ICBO ES ICBO Evaluation Service, Inc.
(See ICC-ES)

ICC International Code Council (888) 422-7233
www.iccsafe.org (703) 931-4533

ICC-ES ICC Evaluation Service, Inc. (800) 423-6587
www.icc-es.org (562) 699-0543

SBCCI Southern Building Code Congress International, Inc.
(See ICC)

- C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CE Army Corps of Engineers
www.usace.army.mil

CPSC Consumer Product Safety Commission (800) 638-2772
www.cpsc.gov (301) 504-7923

DOC Department of Commerce (202) 482-2000
www.commerce.gov

DOD Department of Defense (215) 697-6257
http://.dodssp.daps.dla.mil

DOE Department of Energy (202) 586-9220
www.energy.gov

EPA Environmental Protection Agency (202) 272-0167
www.epa.gov

FAA	Federal Aviation Administration www.faa.gov	(866) 835-5322
FCC	Federal Communications Commission www.fcc.gov	(888) 225-5322
FDA	Food and Drug Administration www.fda.gov	(888) 463-6332
GSA	General Services Administration www.gsa.gov	(800) 488-3111
HUD	Department of Housing and Urban Development www.hud.gov	(202) 708-1112
LBL	Lawrence Berkeley National Laboratory www.lbl.gov	(510) 486-4000
NCHRP	National Cooperative Highway Research Program (See TRB)	
NIST	National Institute of Standards and Technology www.nist.gov	(301) 975-6478
OSHA	Occupational Safety & Health Administration www.osha.gov	(800) 321-6742 (202) 693-1999
PBS	Public Building Service (See GSA)	
PHS	Office of Public Health and Science www.osophs.dhhs.gov/ophs	(202) 690-7694
RUS	Rural Utilities Service (See USDA)	(202) 720-9540
SD	State Department www.state.gov	(202) 647-4000
TRB	Transportation Research Board www.nas.edu/trb	(202) 334-2934
USDA	Department of Agriculture www.usda.gov	(202) 720-2791
USPS	Postal Service www.usps.com	(202) 268-2000

- D. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CBHF State of California, Department of Consumer Affairs (800) 952-5210
Bureau of Home Furnishings and Thermal Insulation (916) 574-2041
www.dca.ca.gov/bhfti

CPUC California Public Utilities Commission (415) 703-2782
www.cpuc.ca.gov

TFS Texas Forest Service (936) 639-8180
Forest Resource Development
<http://txforestsERVICE.tamu.edu>

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 42 00

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

- A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. All architectural components shall be in accordance with the seismic requirements of the governing codes; refer to Division 01 Section "Summary."
- C. Related Sections include the following:
 - 1. Division 01 Section "Summary" for limitations on utility interruptions and other work restrictions.
 - 2. Division 01 Section "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
 - 3. Division 01 Section "Execution" for progress cleaning requirements.
 - 4. Divisions 02 through 49 Sections for temporary heat, ventilation, and humidity requirements for products in those Sections.

1.3 DEFINITIONS

- A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

1.4 TEMPORARY HEATING, COOLING AND VENTILATION

- A. Conditions Required
 - 1. Provide and operate equipment required to control temperature and humidity, as necessary to facilitate progress of work.
 - 2. Provide heating, ventilating and cooling required to maintain adequate conditions.
 - a. To control humidity and to prevent condensation which would have an adverse affect on products and finishes or which would affect application of materials.
 - b. To cure installed materials.
 - 3. Ventilation Required

- a. General: To prevent hazardous accumulations of dusts, fumes, mists, vapors or gases in areas occupied during construction.
 - 1) Provide in accordance with SMACNA Guidelines for Occupied Buildings Under Construction.
 - 2) Provide exhaust ventilation to prevent harmful dispersal of hazardous substances into atmosphere of occupied areas.
 - 3) Dispose of exhaust materials in a manner which will not result in harmful exposure to persons.
 - 4) Ventilate storage spaces containing hazardous or volatile materials.

1.5 USE CHARGES

- A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: Owner shall pay sewer service use charges for sewer usage by all entities for construction operations.
- C. Water Service: Owner shall pay water service use charges for water used by all entities for construction operations.
- D. Electric Power Service: Owner shall pay electric power service use charges for electricity used by all entities for construction operations.

1.6 SUBMITTALS

- A. Site Plan and Floor Plans: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.7 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.8 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Wood Enclosure Fence: Plywood 3/4 inch (19 mm), 6 feet (1.8 m) high, framed with four 2-by-4-inch (50-by-100-mm) rails, with preservative-treated 4 x 4 wood posts spaced not more than 8 feet (2.4 m) apart.
- B. Lumber and Plywood: Comply with requirements in Division 06 Section "Rough Carpentry."
- C. Gypsum Board: Minimum 5/8 inch (15.875 mm) thick by 48 inches (1219 mm) wide by maximum available lengths; regular-type panels with tapered edges. Comply with ASTM C 36/C 36M.
- D. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.
- E. Paint: Comply with requirements in Division 09 painting Sections.

2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of construction personnel. Keep office clean and orderly. Furnish and equip offices as follows:
 - 1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
 - 2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with not less than 1 receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- (1.2-m-) square tack board.
 - 3. Drinking water and private toilet.
 - 4. Coffee machine and supplies.
 - 5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F (20 to 22 deg C).
 - 6. Lighting fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height.
 - 7. Telefacsimile: One direct line machine.
 - 8. Computer with High-speed Internet Service: One compatible with Architect's, Owner's and Contractor's systems.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
 - 1. Store combustible materials apart from building.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return air grille in system and remove at end of construction.

2.4 USE OF EXISTING FACILITIES

- A. Existing facilities at the site may be used for field offices or for storage if allowed by the Owner.

2.5 USE OF PERMANENT FACILITIES

- A. When permanent facilities are enclosed and habitable, with operable mechanical and electrical facilities, relocate the offices into the building.
 - 1. Consult with Architect and Owner; obtain written permission prior to use of selected areas.
 - 2. Provide specified furnishings, equipment and services.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 - 1. Connect temporary sewers to system as directed by authorities having jurisdiction.
- C. Water Service: Use of Owner's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
 - 1. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
 - 1. Toilets: Use of Owner's existing toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- G. Electric Power Service: Use of Owner's existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to Owner.
- H. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
 - 1. Connect temporary service to Owner's existing power source, as directed by Owner.
- I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- J. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel.
 1. Provide additional telephone lines for the following:
 - a. Provide a dedicated telephone line for each facsimile machine and computer in each field office.
 2. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractor's home office.
 - d. Architect's office.
 - e. Engineers' offices.
 - f. Owner's office.
 - g. Principal subcontractors' field and home offices.
 3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.
- K. Electronic Communication Service: Provide temporary electronic communication service, including electronic mail, in common-use facilities.
 1. Provide DSL or T-1 line in primary field office.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 1. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines. Comply with NFPA 241.
 2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 2. Maintain access for fire-fighting equipment and access to fire hydrants.
 3. Provide, operate and maintain equipment, services and personnel, with traffic control and protective devices, as required to expedite vehicular traffic flow on haul routes, at site entrances, on-site access roads, and parking areas.
 4. Remove temporary equipment and facilities when no longer required, restore grounds to original, or to specified conditions.
 5. Traffic Signals and Signs

- a. Provide and operate traffic control and directional signals required to direct and maintain an orderly flow of traffic in all areas under Contractor's control, or affected by contractor's operations.
 - b. Provide traffic control and directional signs, mounted on barricades or standard posts:
 - 1) At each change of direction of a roadway and at each crossroads.
 - 2) At detours.
 - 3) At parking areas.
- 6. Flagmen
 - a. Provide qualified and suitably equipped flagmen when construction operations encroach on traffic lanes, as required for regulation of traffic.
- 7. Flares and Lights
 - a. Provide flares and lights during periods of low visibility:
 - 1) To clearly delineate traffic lanes and to guide traffic.
 - 2) For use by flagmen in directing traffic.
 - b. Provide illumination of critical traffic and parking areas.
- 8. Construction Parking Control
 - a. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, Owner's operations, or construction operations.
 - b. Monitor parking of construction personnel's private vehicles:
 - 1) Maintain free vehicular access to and through parking areas.
 - 2) Prohibit parking on or adjacent to access roads, or in nondesignated areas.
- C. Parking: Use designated areas of Owner's existing parking areas for construction personnel.
- D. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
 - 1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
 - 2. Remove snow and ice as required to minimize accumulations.
- E. Project Identification and Temporary Signs: Provide Project identification and other signs in accordance with local sign ordinances. Install signs where indicated to inform public and individuals seeking entrance to Project. Unauthorized signs are not permitted.
 - 1. One painted sign, not less than 4 feet x 8 feet, with painted graphic content to include:
 - a. Title of Project.

- b. Name of Owner.
 - c. Names and Titles of authorities.
 - d. Name of Architect.
 - e. Name of contractor or construction Manager.
- 2. Provide temporary, directional signs for construction personnel and visitors.
- 3. Maintain and touchup signs so they are legible at all times.
- 4. Structure and Framing: May be new or used, wood or metal, in sound condition structurally adequate to work and suitable for specified finish.
- 5. Sign Surfaces: Exterior softwood plywood with medium density overlay, standard large sizes to minimize joints. Thickness: As required by standards to span framing members (not less than 3/4 inch thick), to provide even, smooth surface without waves or buckles.
- 6. Rough Hardware: Galvanized.
- 7. Paint: Exterior quality, as specified in Section 09 91 13.
 - a. Use Bulletin colors for graphics.
 - b. Colors for Structure, Framing, Sign Surfaces and Graphics: As selected by Architect.
- 8. Paint all exposed surfaces of supports, framing and surface material; one coat of primer and one coat of exterior paint.
- 9. Paint graphics in styles, sizes and colors selected.
- F. Waste Disposal Facilities: Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."
- G. Existing Elevator Use: Use of Owner's existing elevators will be permitted, as long as elevators are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore elevators to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life.
 - 1. Do not load elevators beyond their rated weight capacity.
 - 2. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.
- H. Existing Stair Usage: Use of Owner's existing stairs will be permitted, as long as stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
 - 1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If, despite such protection, stairs become damaged, restore damaged areas so no evidence remains of correction work.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 - 1. Comply with work restrictions specified in Division 01 Section "Summary."
- B. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials.
- C. Project Area Enclosure: Before construction operations begin, furnish and install project area enclosure barricades in a manner that will prevent people from easily entering site except by entrance doors/gates.
 - 1. Extent of Barricade: As required to enclose entire Project area or portion determined sufficient to accommodate construction operations and as indicated on Drawings.
 - 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide Owner with one set of keys.
- D. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
- E. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- F. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 - 1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.
- G. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration, to provide weather protection, allow for effective temporary heat to prevent entry of unauthorized persons, and to separate areas occupied by Owner from fumes and noise.
 - 1. Insulate partitions to provide noise protection to occupied areas.
 - 2. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.
 - 3. Protect air-handling equipment.
 - 4. Weather strip openings.
 - 5. Provide walk-off mats at each entrance through temporary partition.

H. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

1. Prohibit smoking in construction areas.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

I. Provide a project security program, to:

1. Protect Work, stored products and construction equipment from theft and vandalism.
2. Protect premises from entry by unauthorized persons.
3. Protect Owner's operations at site from theft, vandalism or damage from Contractor's work or employees.
4. Initiate security program in compliance with Owner's system, prior to job mobilization.
5. Maintain security program throughout construction period, until Owner occupancy or Owner acceptance precludes the need for Contractor security.
6. Identification
 - a. Provide identification to each person authorized to enter the Project premises, showing:
 - 1) Personal photograph.
 - 2) Name of the individual and assigned number.
 - 3) Name of employer.
 - b. Maintain a current list of accredited persons; submit a copy of the list to Owner on request.
 - c. Require that identification be displayed by all persons entering, and on, the premises.
7. Exclude from site personnel not properly identified.
8. Entrance Control
 - a. Provide control of all persons and vehicles entering and leaving Project site.
 - 1) Require display of proper identification by each person.
 - 2) Allow no visitors except with issuance of temporary identification.
 - 3) Maintain log of visitors.
 - b. Owner will control deliveries and vehicles related to his own operations.
9. Patrol/Guard Service
 - a. Contractor has the option of placing or not placing a watchman at the site at all times when the buildings are not in the charge of his superintendent. Contractor shall be responsible at all times for all work and materials.

- b. However, Contractor shall employ and pay for a watchman at all times, except normal working hours, that temporary heat is being used and as deemed necessary to meet provisions of the Contract.

3.5 MUD CONTROL

- A. Provide methods, means and facilities to prevent the depositing of mud, etc., on public thoroughfares or Owner-used roads. Provide periodic inspection of traffic areas to enforce requirements.

3.6 POLLUTION CONTROL

- A. Provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations.
- B. Provide equipment and personnel, perform emergency measures required to contain any spillages, and to remove contaminated soils or liquids. Excavate and dispose of any contaminated earth off-site in a safe legal manner, and replace with suitable compacted fill and topsoil.
- C. Take special measures to prevent harmful substances from entering public waters. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams, or in sanitary or storm sewers.
- D. Provide systems for control of atmospheric pollutants.
 - 1. Prevent toxic concentrations of chemicals.
 - 2. Prevent harmful dispersal of pollutants into the atmosphere.

3.7 POWER

- A. All power outages shall be coordinated with the Owner, providing a minimum of 48 hours advance notice.

3.8 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION 01 50 00

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.
- B. All architectural components shall be in accordance with the seismic requirements of the governing codes; refer to Division 01 Section "Summary."
- C. Related Sections include the following:
 - 1. Division 01 Section "References" for applicable industry standards for products specified.
 - 2. Division 01 Section "Closeout Procedures" for submitting warranties for Contract closeout.
 - 3. Divisions 02 through 49 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, which is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through substitution process, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.4 SUBMITTALS

- A. Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.
 - 1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
 - 2. Form: Tabulate information for each product under the following column headings:
 - a. Specification Section number and title.
 - b. Generic name used in the Contract Documents.
 - c. Proprietary name, model number, and similar designations.
 - d. Manufacturer's name and address.
 - e. Supplier's name and address.
 - f. Installer's name and address.
 - g. Projected delivery date or time span of delivery period.
 - h. Identification of items that require early submittal approval for scheduled delivery date.
 - 3. Completed List: Within 60 days after date of commencement of the Work, submit 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
 - 4. Architect's Action: Architect will respond in writing to Contractor within 15 days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.
- B. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified material or product cannot be provided.

- b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, which will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
 - i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
 - j. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
 - k. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
- a. Form of Acceptance: Change Order.
 - b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.
- C. Comparable Product Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
- a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."

- b. Use product specified if Architect cannot make a decision on use of a comparable product request within time allocated.
- D. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.
 - 1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 - 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
- C. Storage and Protection:
 - 1. Store products to allow for inspection and measurement of quantity or counting of units.
 - 2. Store materials in a manner that will not endanger Project structure.
 - 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 - 4. Store cementitious products and materials on elevated platforms.
 - 5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
 - 6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 - 7. Protect stored products from damage and liquids from freezing.

8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.
9. It is the responsibility of the installing contractor to provide the protection referenced in this article until acceptance by the Owner or Architect. This can be waived only by the Contractor who then assumes such responsibility.

1.7 WORKMANSHIP

- A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.
- B. Perform work by persons qualified to produce workmanship of specified quality.
- C. Fasteners/Anchors
 1. Fasteners/anchors shall be of strength required for proper support and where possible shall be concealed.
 2. Type of exposed fastener/anchor shall be in character with the use of the host location; type of concealed fastener/anchor shall not interfere with or prevent required fit of anchored item to its substrate.
 3. Material of exposed or concealed fastener/anchor shall be of quality and durability equal to that of material of item being anchored.
 4. Finish of exposed fastener/anchor shall match finish of item being anchored.

1.8 MANUFACTURER'S INSTRUCTIONS

- A. Work shall be in compliance with manufacturer's instructions, unless specifically stated otherwise. Submit copies of instructions as specified in Section 01300.
- B. Perform work in accordance with details of instructions and specified requirements. Should a conflict exist between Specifications and instructions, consult with Architect before proceeding.

1.9 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 1. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
 3. Refer to Divisions 02 through 49 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction. Warranty work shall be done to not inconvenience the Owner or user.
- D. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- E. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.
- F. Warranties shall not be prorated nor shall their value be limited to a certain amount.
- G. Owner's Recourse: Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.
- H. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
- I. Where the Contract Documents require a warranty, or similar commitment on the Work or part of the Work, the Owner reserves the right to refuse to accept the Work, until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.
- J. By bidding the work, the sub-bidders and Contractors indicate that no requirements within the Contract Documents will prevent the issuance of warranties in accordance with the specifications, thus the specified warranties will be provided.
- K. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

B. Product Selection Procedures:

1. Product: Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
5. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.
6. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.
7. Visual Matching Specification: Where Specifications require matching an established Sample, select a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
8. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.

- a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
- b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

A. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
2. Requested substitution does not require extensive revisions to the Contract Documents.
3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
4. Substitution request is fully documented and properly submitted.
5. Requested substitution will not adversely affect Contractor's Construction Schedule.
6. Requested substitution has received necessary approvals of authorities having jurisdiction.
7. Requested substitution is compatible with other portions of the Work.
8. Requested substitution has been coordinated with other portions of the Work.
9. Requested substitution provides specified warranty.
10. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

2.3 SUBSTITUTIONS

A. Substitutions of Equipment and Materials During Bidding

1. **Requests for Substitutions.** The Bidder shall make requests for Substitutions on the County's Requests for Substitution form included in the Bidding Documents. Such requests shall comply with the requirements of the Bidding Documents, including without limitation, the Plans and the Specifications. Without limitation to the other requirements of the Request for Substitution form, requests for Substitutions shall include: (1) a description of the material, equipment or other work that is to be replaced or eliminated by the Substitution; (2) a description of any other changes to the Work, Existing Improvements, the Site or the work of Separate Contractors that would be necessary if the proposed Substitution were incorporated as part of the Work; (3) a statement that the Bidder accepts responsibility for

the inclusion in its Bid of all of the costs of implementing the Substitution, including, without limitation, the costs of any related changes to the Work, Existing Improvements, the Site or the work of Separate Contractors; (4) all the drawings, performance and the test data and other information necessary for an evaluation of the Substitution by the County, Architect and County Consultants; and (5) a statement that the Bidder understands and agrees that if the Substitution is not approved and the Bidder submits a Bid, Bidder will provide the Work as specified in the Bidding Documents without such Substitution. The burden of proof of the merit of a proposed Substitution is entirely upon the Bidder requesting the Substitution.

2. **Deadline for Submission.** Any completed Request for Substitution form that Bidders wishes to have considered by County must be submitted, between the hours of 8:00 a.m. and 5:00 p.m. on any Day, Monday through Thursday (except Holidays) up to, including and no later than the seventh (7th) Day prior to the Bid Closing Deadline, in writing, by hand delivery, mail, or fax to the following: Economic Development Agency Project Management Office, 3403 10th Street, Suite 400, Riverside, CA 92501. T: (951) 955-4897; F: (951) 955-4890; cwaltman@rivcoeda.org. No response will be made to any Requests for Substitution form received after that time.
- B. After award of Contract, Architect will consider formal requests from the Contractor for substitution of products in place of those specified only in case of product unavailability or other conditions beyond the control of Contractor.
- C. Submit separate request for each substitution. Support each request with:
1. Complete data substantiating compliance of proposed substitution with requirements stated in Contract Documents:
 - a. Product identification, including manufacturer's name and address, and Specification Section, paragraph and page numbers.
 - b. Manufacturer's literature; identify:
 - 1) Product description.
 - 2) Reference standards.
 - 3) Performance and test data.
 - c. Samples, as applicable.
 - d. Name and address of not less than 4 nor more than 6 similar projects on which product has been in use for not less than 3 years, and date of each installation. Include name and telephone number of Owner's representative familiar with installation.
 2. Itemized comparison of the proposed substitution with product specified; list significant variations.
 3. Data relating to changes in construction schedule.
 4. Any effect of substitution on separate contracts.
 5. List of changes required in other work or products.
 6. Accurate cost data comparing proposed substitution with product specified (not required for substitution request during bidding).
 7. Designation of required license fees or royalties.

8. Designation of availability and location of maintenance services, sources of replacement materials.
- D. Substitutions will not be considered for acceptance when:
1. They are indicated or implied on Shop Drawings or Product Data submittals without a formal request from Contractor.
 2. They are requested directly by a Subcontractor or supplier.
 3. Acceptance will require substantial revision of Contract Documents.
- E. Substitute products shall not be ordered or installed without written acceptance of Architect and Owner.
- F. Should a substitution be approved under the foregoing provisions and subsequently prove to be defective or otherwise unsatisfactory for the intended use or functions, Contractor shall, without cost to Owner and without obligation on the part of Architect replace the substitute with the product, material, or equipment originally specified, if available, or another substitution conforming to the above requirements.
- G. Contractor's Representation
1. In making formal request for substitution Contractor represents that:
 - a. He has investigated proposed product and has determined that it is equal to or superior in all respects to that specified.
 - b. He will provide same warranties or bonds for substitution as for product specified.
 - c. He will coordinate installation of accepted substitution into the Work, and will make such changes as may be required for the Work to be complete in all respects.
 - d. He waives claims for additional costs caused by substitution which may subsequently become apparent.
 - e. Cost data is complete and includes all related costs under his Contract.
- H. Additional costs (such as redesign time, testing, etc.) related to the substitution, over which the Contractor has no control, will also be considered and will be included in the substitution change order request.
- I. Architect shall notify Contractor, in writing, of decision to accept or reject requested substitution.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00