

**PARADISE HIGH SCHOOL
BASEBALL FIELD IRRIGATION & TURF
REPLACEMENT**

PARADISE UNIFIED SCHOOL DISTRICT

PROJECT MANUAL

May 31, 2023

PROJECT #19033.199.37

Studio W

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SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 1. Work covered by the Contract Documents.
 2. Type of the Contract.
 3. Work phases.
 4. Use of premises.
 5. Work restrictions.
 6. Specification formats and conventions.
 7. Pollution Control.
 8. Lead-Containing materials.
- B. Related Sections include the following:
 1. Division 1 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.
 2. Division 1 Section "Closeout Procedures" for mechanical and electrical Title 24 Certificate of Acceptance requirements.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: Paradise High School – Baseball Field Irrigation & Turf Replacement
- B. Owner: Paradise Unified School District
- C. Architect: Studio W Architects
- D. The Work consists of the following:
 1. Regrading of landscape and replacement of existing turf with new soil prep and sod at the baseball field.
 2. Replacement of chain-link fencing at area of work as noted.
 3. Construction of new water lines, new irrigation, and associated equipment.

1.4 TYPE OF CONTRACT

- A. Project will be constructed under a single prime contract.

1.5 WORK PHASES

- A. The Work shall be conducted in single phases as indicated on Drawings.

1.6 USE OF PREMISES

- A. General: Contractor shall have limited use of premises for construction operations as indicated on Drawings by the Contract limits.
- B. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1.7 WORK RESTRICTIONS

- A. On-Site Work Hours:
 - 1. Work shall be generally performed during normal business working hours of 8 a.m. to 5 p.m., Monday through Friday, except as otherwise indicated.

1.8 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 49-division format and CSI's MasterFormat 2004 numbering system.
 - 1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
 - 2. Division 1: Sections in Division 1 govern the execution of the Work of all Sections in the Specifications.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
 - 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
 - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

1.9 POLLUTION CONTROL

- A. Provide positive methods, means and facilities required to prevent contamination of the soil, water or atmosphere by the discharge of noxious substances from the construction operations.

1.10 MISCELLANEOUS PROVISIONS

- A. Noise Control: The Contractor shall install noise reducing devices on construction equipment. Contractor shall comply with the requirements of the city and county having jurisdiction with regard to noise ordinances governing construction sites and activities. Construction Equipment noise at the Site shall be limited and only as permitted by applicable law, rule or regulation. If classes are in session at any point during the progress of the Work, and, in the Owner's reasonable discretion, the noise from any Work disrupts or disturbs the students or faculty or the normal operation of Owner, at the Owner's request, the Contractor shall schedule the performance of all such Work around normal hours or make other arrangements so that the Work does not cause such disruption or disturbance. In no event shall such arrangements result in adjustment of the Contract Price or the Contract Time.
- B. Dust Control. The Contractor shall be fully and solely responsible for maintaining and upkeeping all areas of the Site and adjoining areas, outdoors and indoors, free from flying debris, grinding powder, sawdust, dirt and dust as well as any other product, product waste or work waste, that by becoming airborne may cause respiratory inconveniences to persons, particularly to students and Owner's personnel. Additionally, the Contractor shall take specific care to avoid deposits of airborne dust or airborne elements. Such protection devices, systems or methods shall be in accordance with the regulations set forth by the EPA and OSHA, and other applicable law, rule or regulation. Additionally, the Contractor shall be the sole party responsible to regularly and routinely clean up and remove any and all deposits of dust and other elements. Damage and/or any liability derived from the Contractor's failure to comply with these requirements shall be exclusively at the cost of the Contractor, including, without limitation, any and all penalties that may be incurred for violations of applicable law, rule or regulation, and any amounts expended by the Owner to pay such damages shall be due and payable to the Owner on demand. Contractor shall replace any damages property or part thereof and professionally clean any and all items that become covered or partially covered to any degree by dust or other airborne elements. If classes are in session at any point during the progress of Work, and, in the Owner's reasonable discretion, flying debris, grinding powder, sawdust, dirt or dust from any Work disrupts or disturbs the students or faculty or the normal operation of the college, at the Owner's request, the Contractor shall schedule the performance of all such Work around normal college hours and make other arrangements so that the Work does not cause such disruption or disturbance. In no event shall such arrangements result in adjustment of the Contract Price or the Contract Time.

1.11 LEAD-CONTAINING MATERIALS.

- A. The Contractor shall assume that all ceramic tile and painted or varnished surfaces in the school district contain detectable levels of lead which trigger compliance with California Code of Regulation, Title 8, Section 1532.1. In addition, waste products from these materials could contain lead at levels which are subject to the hazardous waste requirements in the California

Code of Regulations, Title 22, Sections 66260.1 - 66263.12 and 66268.1 - 66268.124 and the health and Safety Code Section 25157.8 and 25163, subdivision (c).

- B. It is the Contractor's responsibility to handle and dispose of these materials in accordance with the regulations. If failure to comply with these regulations results in a site or worker contamination, the Contractor will be held solely responsible for all costs involved in any required corrective action.

- C. Lead-based paint should be removed only by professionals trained in hazardous material removal. A trained professional must follow very detailed procedures to minimize, control and contain lead dust generated by the removal process.
 - 1. The room should be sealed from the rest of the building. All furniture, carpets and drapes should be removed.
 - 2. Workers should wear respirators designed to avoid inhaling lead.
 - 3. No eating or drinking should be allowed in the work area. All food and eating utensils should be removed from the room. All cabinets as well as food contact surfaces should be covered and sealed.
 - 4. Occupants should be kept out of the room until the job is completed.
 - 5. Clothing worn in the room should be disposed of after working. The work clothing should not be worn in other areas of the building.
 - 6. Debris should be cleaned up using special vacuum cleaners with HEPA (high efficiency particle absorption) filters. A wet mop should be used after vacuuming.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Sections include the following:
 - 1. Division 1 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

1.3 MINOR CHANGES IN THE WORK

- A. Architect may issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, or Changes not affecting the Structural Safety, Access Compliance or Fire & Life Safety portions of the work, on AIA Document G710, "Architect's Supplemental Instructions" or an equivalent form acceptable to District and subject to DSA IR A-6 Construction Change Document Submittal and Approval Process (Title 24, Part 1, California Code or Regulations, Section 4-338) requirements for DSA Construction Change Document – Category B.

1.4 PROPOSAL REQUESTS (BULLETIN)

- A. Owner-Initiated Proposal Requests: Architect may issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal Requests issued are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

1.5 CONSTRUCTION (FIELD) CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 FORMS

- A. Construction Change Directive

END OF SECTION 01 26 00

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Sections include the following:
 - 1. Division 1 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 2. Division 1 Section "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

1.3 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
 - 1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with Continuation Sheets.
 - b. Submittals Schedule.
 - c. Contractor's Construction Schedule.
 - 2. Submit the Schedule of Values to Architect at earliest possible date but no later than 7 days before the date scheduled for submittal of initial Applications for Payment.
 - 3. No payment applications will be signed by the Architect prior to the Contractor submitting, and the Architect reviewing, a schedule of values.
- B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.
 - 1. Identification: Include the following Project identification on the Schedule of Values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 - 2. Submit draft of AIA Document G703 Continuation Sheets.

3. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value.
 - 1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
6. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If specified, include evidence of insurance or bonded warehousing.
7. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
9. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.4 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times:
 1. The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.

- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
 2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- F. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of Values.
 3. Contractor's Construction Schedule (preliminary if not final).
 4. Products list.
 5. Schedule of unit prices.
 6. Submittals Schedule (preliminary if not final).
 7. List of Contractor's staff assignments.
 8. List of Contractor's principal consultants.
 9. Copies of building permits.
 10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 11. Initial progress report.
 12. Report of preconstruction conference.
 13. Certificates of insurance and insurance policies.
 14. Data needed to acquire Owner's insurance.
 15. Initial settlement survey and damage report if required.
- G. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- H. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."

6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Final, liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - 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 1 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. Project meetings.
 - 2. Requests for Interpretation (RFIs).
- B. Related Sections include the following:
 - 1. Division 1 Section "Submittal Procedures" for electronic submittals.
 - 2. Division 1 Section "Construction Progress Documentation" for preparing and submitting Contractor's Construction Schedule.
 - 3. Division 1 Section "Execution Requirements" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 4. Division 1 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.3 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.

1.4 SUBMITTALS

- A. Submit electronic submittals directly to extranet specifically established for Project.

1.5 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
 4. Frequency of Attendance by Architect: Limited by Architect/Owner Contract.
- B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing, if any.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for RFIs.
 - g. Procedures for testing and inspecting.
 - h. Procedures for processing Applications for Payment.
 - i. Distribution of the Contract Documents.
 - j. Submittal procedures.
 - k. Preparation of Record Documents.
 - l. Use of the premises.
 - m. Work restrictions.
 - n. Owner's occupancy requirements.
 - o. Responsibility for temporary facilities and controls.
 - p. Construction waste management and recycling.
 - q. Parking availability.
 - r. Office, work, and storage areas.
 - s. Equipment deliveries and priorities.
 - t. First aid.
 - u. Security.
 - v. Progress cleaning.
 - w. Working hours.
 3. Minutes: Record and distribute meeting minutes electronically.
- C. Preinstallation Conferences: 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.
 - D. Progress Meetings: Conduct progress meetings at regular 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) 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) Status of correction of deficient items.
 - 14) Field observations.
 - 15) RFIs.
 - 16) Status of proposal requests.
 - 17) Pending changes.
 - 18) Status of Change Orders.
 - 19) Pending claims and disputes.
 - 20) Documentation of information for payment requests.
3. Minutes: Record the meeting minutes electronically.
 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.

1.6 RFIs:

A. General:

1. Contractor may submit a RFI to the Architect seeking clarification or interpretation of the contract documents. If in the Contractor's opinion the nature of the RFI requires a discussion, rather than simply an answer, the Contractor shall call the Architect to have such a discussion. The results of that discussion as well as all other RFI's must be presented in writing on a form approved in advanced by the Architect along with any supporting information or data, as well as the Contractor's recommended resolution. An oral RFI or a RFI presented on an unapproved form, or without adequate supporting information and Contractor's recommended solution, will be attributed solely to the contractor. Architect's review of or responses to RFI's shall not constitute an approval, direction, or procedure related to the construction means, methods, techniques, sequences, or procedures of the Contractor.
2. Architect's review of or responses to RFI's shall not constitute an approval, direction, or procedure related to the construction site safety precautions, procedures, or methodology of the Contractor.
3. The use of a RFI is limited to clarification of the contract documents. Contractor will limit each RFI to a single issue. Information which is discernable from the contract documents; construction means and methods; product substitution submittals; product submittals; and construction site safety will not be addressed by the Architect in responding to a RFI.
4. Architect's response to a RFI is not a change order or directive authorizing an increase in construction cost or time.

B. 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.

- C. Frivolous or Unnecessary RFIs: Cost of design professional's time will be billed or deducted from progress payment.
- D. Electronic RFIs: Follow vendor's instruction.
 - 1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- E. Architect's Action: Architect will review each RFI, determine action required, and return it. Allow 21 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 1 Section "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
- F. RFI Log: Prepare, maintain, and submit as instructed by electronic submittal vendor.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 FORMS

- A. Electronic versions of attached forms will be provided upon request.
 - 1. RFI Form.

END OF SECTION 013100

SECTION 013200 - 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 1 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. Contractor's Construction Schedule.
 - 2. Submittals Schedule.
 - 3. Three Week Look-Ahead Schedule.
 - 4. Daily construction reports.
- B. Related Sections include the following:
 - 1. Division 1 Section "Payment Procedures" for submitting the Schedule of Values.
 - 2. Division 1 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
 - 3. Division 1 Section "Submittal Procedures" for submitting schedules and reports.
 - 4. Division 1 Section "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 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 review.
- B. Contractor's Construction Schedule: Submit three opaque copies of schedule, large enough (minimum 11 x 17) to show entire schedule for entire construction period.
- C. Daily Construction Reports: Submit two copies at weekly intervals.

1.4 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. Concurrent with the development of the Contractor's construction schedule, prepare a complete schedule of submittals. Submit the submittal schedule with the Contractor's construction schedule described above.
 - 1. Coordinate submittal schedule with the list of subcontracts, schedule of values and the list of products as well as the Contractor's construction schedule.
 - 2. The Architect will review the schedule and indicate which submittals may be deleted from the submission requirement. The deletion of the submittal requirement for an item does not release the Contractor from any requirements of the Construction Contract, General Conditions or Plans and Specifications.
- B. Prepare the schedule in chronological order; include submittals required during the first 90 days of construction. Provide the following information:
 - 1. Scheduled date for the first submittal.
 - 2. Related Section number.
 - 3. Submittal category.
 - 4. Name of subcontractor.
 - 5. Description of the part of the Work covered.
 - 6. Scheduled date for resubmittal.
 - 7. Scheduled date the Architect's final release or review.
- C. Distribution: Following response to initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the project meeting room and field office.
 - 1. When revisions are made, distribute 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 construction activities.
- D. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chart type Contractor's construction schedule. Submit within 15 days of the date established for "Commencement of the Work". The Construction Schedule must be submitted and accepted prior to approval of first pay application.
1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as identified in the "Schedule of Values".
 2. Within each time bar indicate estimated completion percentage in 10 percent increments. As work progresses, place a contrasting mark in each bar to indicate Actual Completion.
 3. Prepare the schedule on a sheet, or series of sheets, of stable reproducible media, of sufficient width to show data for the entire construction period.
 4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically sequences necessary for completion of related portions of the Work.
 5. Coordinate the Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests and other schedules.
 6. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Architect's procedures necessary for certification of Substantial Completion.
- B. Phasing: Provide notations on the schedule to show how the sequence of the Work is affected by requirements for phased completion to permit work by separate Contractors and partial occupancy by the Owner prior to Substantial Completion.
- C. Work Stages: Indicate important stages of construction for each major portion of the Work, including testing and installation.
- D. Area Separations: Provide a separate time bar to identify each major construction area for each major portion of the Work. Indicate where each element in an area must be sequenced or integrated with other activities.
- E. Cost Correlation: At the head of the schedule, provide a two item cost correlation line, indicating "pre-calculated" and "actual" costs. On the line show dollar-volume of work performed as of the dates used for preparation of payment requests.
1. Refer to Section "Payment Procedures" for cost reporting and payment procedures.

2.3 THREE WEEK LOOK-AHEAD SCHEDULE

- A. Prepare weekly (or as determined by scheduled meeting times), prior to Project meetings, a computer-generated 3-week look-ahead schedule (bar chart) which is consistent with the Contractors schedule and depicts daily labor activities. The schedule will consist of the prior week, current week and the following 3 weeks.

2.4 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.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week 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 changes, including, but not limited to, changes in durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate Actual Completion percentage for each activity.
- B. Distribution: Distribute copies of reviewed 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.

3.2 FORMS

- A. Electronic versions of attached forms will be provided upon request.
 - 1. Submittals Schedule Form.

END OF SECTION 013200

SECTION 013300 - 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 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for electronically submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Consult individual sections of specifications for specific submittals required under those sections and for further details and descriptions of requirements.
- C. Related Sections include the following:
 - 1. Division 1 Section "Payment Procedures" for submitting Applications for Payment and the Schedule of Values.
 - 2. Division 1 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
 - 3. Division 1 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
 - 4. Division 1 Section "Quality Requirements" for submitting test and inspection reports.
 - 5. Division 1 Section "Closeout Procedures" for submitting warranties.
 - 6. Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 7. Division 1 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 8. Other Sections for specific requirements for submittals in those Sections.

1.3 DEFINITIONS

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

1.4 SUBMITTAL PROCEDURES

- A. Processing: All costs for electronic submittal, printing, preparing, packaging, mailing, or delivering submittals for initial submittals and all costs for re-printing, re-drawing, re-drafting,

re-packaging, re-submitting, and re-mailing or re-delivering as required for all re-submittals shall be included in Contract Sum.

- B. Sequence: Transmit each submittal in sequence which will not result in Architect's approval having to be later modified or rescinded by reason of subsequent submittals which should have been processed earlier or concurrently for coordination.
- C. 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.
- D. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- E. Multiple Reviews: The Contractor shall also be responsible for all costs to Architect or Architect consultants for reviews requiring more than 2 reviews for same specification section.
- F. 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. Review: Allow 7 days for review of each submittal. Architect will request for more time if needed.
- G. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.
- 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 "Furnish as Corrected".
- 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 approval 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, subject to the following conditions:
 - 1. Submit request using attached form at end of section.
 - a. Indicate date, project name, contractor name, address, and specific drawing (sheet number) required.
 - b. Signed by Contractor agreeing with terms and conditions.

PART 2 - PRODUCTS

2.1 ELECTRONIC SUBMITTALS

- A. General: Prepare and submit Submittals required by individual Specification Sections.
 - 1. Submit electronic submittals directly to extranet specifically established for Project.
 - 2. Vendor:
 - a. Submittal Exchange (Basis of Design)
 - b. Or equal.
 - 3. Contractor shall pay for all-inclusive use of Submittal Exchange by all project team members; data storage, security, and backup; setup, training, and support; and archiving once construction is complete.
 - a. Documentation processed, housed and archived shall include but not limited to: Submittals, Addendum, Plans, Specs, Field Reports, Photos, Weekly Reports, Notice of deviations, Punch List, RFI's RFP's ASI's, CCD's, Cost Proposals, Test Reports, Meeting Notes., and Close Out.

2.2 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.
 - a. Circle items applicable.
 - b. Cross-out items not applicable.
 - c. Select item number if required.
 - 3. Submittal data must include complete documentation relating to all the specified features
 - 4. Include the following information, as applicable:
 - a. Manufacturer's Submittal Form with all the options selected when available.
 - b. Manufacturer's written recommendations.
 - c. Manufacturer's product specifications.
 - d. Manufacturer's installation instructions.
 - e. Standard color charts.
 - f. Manufacturer's catalog cuts.
 - g. Wiring diagrams showing factory-installed wiring.

- h. Printed performance curves.
 - i. Operational range diagrams.
 - j. Mill reports.
 - k. Standard product operation and maintenance manuals.
 - l. Compliance with specified referenced standards.
 - m. Testing by recognized testing agency.
 - n. Application of testing agency labels and seals.
 - o. Notation of coordination requirements.
 5. Submit Product Data before or concurrent with Samples.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Dimensions.
 - b. Do not use words "by others." Identify exactly who is responsible for the work.
 - c. Identification of products.
 - d. Fabrication and installation drawings.
 - e. Roughing-in and setting diagrams.
 - f. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - g. Shopwork manufacturing instructions.
 - h. Templates and patterns.
 - i. Schedules.
 - j. Design calculations.
 - k. Compliance with specified standards.
 - l. Notation of coordination requirements.
 - m. Notation of dimensions established by field measurement.
 - n. Relationship to adjoining construction clearly indicated.
 - o. Seal and signature of professional engineer if specified.
 - p. 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 but no larger than 30 by 40 inches.
 3. Number of Copies: Submit 4 sets of prints and one electronic 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 1 full set 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 sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.
 - 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 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.
 - F. Submittals Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."
 - G. Application for Payment: Comply with requirements specified in Division 1 Section "Payment Procedures."
 - H. Schedule of Values: Comply with requirements specified in Division 1 Section "Payment Procedures."
- 2.3 INFORMATIONAL SUBMITTALS
- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
 1. 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.
2. Test and Inspection Reports: Comply with requirements specified in Division 1 Section "Quality Requirements."
- B. Coordination Drawings: Comply with requirements specified in Division 1 Section "Project Management and Coordination."
 - C. 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.
 - D. 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.
 - E. 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.
 - F. 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.
 - G. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
 - H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
 - I. 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.
 - J. 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.
 - K. 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.

- L. Schedule of Tests and Inspections: Comply with requirements specified in Division 1 Section "Quality Requirements."
- M. 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.
- N. 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.
- O. 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.
- P. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment.
- Q. 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.
- R. 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.
- S. 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.

- T. 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.

2.4 DEFERRED APPROVALS AND 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 3 copies of a statement, signed and sealed by Structural Engineer Licensed in California, 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 each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
 - 1. Coordinate the work; do not delegate responsibility for coordination to any subcontractor.
 - 2. Anticipate the interrelationship of all subcontractors and their relationship with the total work.
 - 3. Resolve differences or disputes between subcontractors and materials suppliers concerning coordination, interference, or extent of work between sections.
 - 4. Trade submittals with “By Others”, “By General Contractor”, or similar coordination and work scope are not allowed. Identify, acknowledge, and resolve scope of work prior to submittal by Contractor. No extras will be allowed. Provide complete and coordinated submittals.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. 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.

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.
- 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.
- F. Architect's and Consultant's review shall neither be construed as complete check nor relieve the Contractor, Subcontractor, manufacturer, fabricator, or supplier from responsibility for any deficiency that may exist or from any departures or deviations from the requirements of the Contract unless the Contractor has, in writing, called the Architect's attention to the deviations at the time of submission as specified.

3.3 FORMS

- A. Electronic versions of attached forms will be provided upon request.
 - 1. Electronic Files Transfer - Architectural Form.

END OF SECTION 013300

Subject: Architectural Electronic Files

Date: _____

Contractor Name: _____

Address: _____

Project: _____

At your request, we will provide electronic files for your convenience and use in the preparation of shop drawings related to _____, subject to the following terms and conditions:

Our electronic files are compatible with AutoCAD. We make no representation as to the compatibility of these files with your hardware or your software beyond the specified release of the referenced specifications.

Data contained on these electronic files are part of our instruments of service and shall not be used by you or anyone else receiving these data through or from you for any purpose other than as a convenience in the preparation of shop drawings for the referenced project. Any other use or reuse by you or by others will be at your sole risk and without liability or legal exposure to us. You agree to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against us, our officers, directors, employees, agents or sub consultants that may arise out of or in connection with your use of the electronic files.

Furthermore, you shall, to the fullest extent permitted by law, indemnify and hold us harmless against all damages, liabilities or costs, including reasonable attorneys' fees and defense costs, arising out of or resulting from your use of these electronic files.

These electronic files are not construction documents. Differences may exist between these electronic files and corresponding hard-copy construction documents. We make no representation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the signed or sealed hard-copy construction documents prepared by us and the electronic files, the signed or sealed hard-copy construction documents shall govern. You are responsible for determining if any conflict exists. By your use of these electronic files, you are not relieved of your duty to fully comply with the contract documents, including, and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other contractors for the project.

Because information presented on the electronic files can be modified, unintentionally or otherwise, we reserve the right to remove all indicia of ownership and/or involvement from each electronic display.

We will furnish you electronic files of the following architectural drawings:

Under no circumstances shall delivery of the electronic files for use by you be deemed a sale by us, and we make no warranties, either express or implied, of merchantability and fitness for any particular purpose. In no event shall we be liable for any loss of profit or any consequential damages as a result of your use or reuse of these electronic files.

If these terms are acceptable to you, please sign in the space provided below as evidence of our mutual understanding and agreement for this service. One signed copy of this agreement shall be returned to our office prior to delivery of the electronic files.

Signature

Date

SECTION 014000 - 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 1 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, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections include the following:
 - 1. Division 1 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
 - 2. Other Sections for specific test and inspection requirements.

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. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- E. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- F. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- G. 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.
- H. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of 5 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.

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. 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.
- D. 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.

- E. Professional Engineer Qualifications: A licensed professional engineer who is legally qualified to practice in California 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.
- F. 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.
- G. Testing Agency Qualifications: An DSA approved 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.
- H. 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. 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 1 Section "Submittal Procedures."
- B. 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.
- C. 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.
- D. 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.
- E. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for commencement of the Work.
 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.
- F. All work shall be in compliance with 2019 Title 24, Parts 1-6 and 9.
- G. 2019 Title 24, Parts 1-5 shall be kept on site during construction.

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.
- 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 014000

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes list of references.

1.3 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "AHJ": Agency having jurisdiction.
- C. "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.
- D. "Compatible": When used for products, it shall comply with requirements including products recommended/ required by the manufacturer for warrantee acceptance.
- E. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed."
- F. "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."
- G. "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.
- H. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- I. "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.

- J. "Owner": As defined in Division 1 section "Summary".
- K. "Provide": Furnish and install, complete and ready for the intended use.
- L. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.4 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.
 - 2. Copies of standards and applicable building codes (Title 24 Parts 1-5) shall be kept on-site during construction.
- 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 standards and regulations.
- E. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized names.
- F. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized names.
- G. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized names.

1.5 QUALITY ASSURANCE

- A. Reference Standards:
 - 1. 2019 California Building Standards Administrative Code, Part 1, Title 24 CBSC.
 - 2. 2019 California Building Code (CBC), Part 2, Title 24 CBSC. (2018 International Building Code of the International Code Council, with California Amendments).
 - 3. 2019 California Electrical Code (CEC), Part 3, Title 24 CBSC (2017 National Electrical Code, with California Amendments).

4. 2019 California Mechanical Code (CMC), Part 4, Title 24 CBSC (2018 Uniform Mechanical Code, with California Amendments).
5. 2019 California Plumbing Code (CPC), Part 5, Title 24, CBSC (2018 Uniform Plumbing Code, with California Amendments).
6. 2019 California Energy Code, Part 6, Title 24 CBSC.
7. 2019 California Historical Code, Part 8, Title 24 CBSC.
8. 2019 California Fire Code, Part 9, Title 24 CBSC. (2018 International Fire Code, with California Amendments).
9. 2019 California Green Building Standards Code (CALGreen Code), Part 11, Title 24 CBSC.
10. 2019 California Referenced Standards Code, Part 12, Title 24, CBSC.
11. NFPA 13 - Automatic Sprinkler Systems (California Amended), 2016 Edition.
12. NFPA 14 - Standpipe Systems (California Amended), 2016 Edition.
13. NFPA 17 - Dry Chemical Extinguishing Systems, 2017 Edition.
14. NFPA 17A - Wet Chemical Extinguishing Systems, 2017 Edition.
15. NFPA 20 - Stationary Pumps, 2016 Edition.
16. NFPA 24 - Private Fire Service Mains (California Amended), 2016 Edition.
17. NFPA 72 - National Fire Alarm and Signaling Code (California Amended).
18. NFPA 80 - Fire Door and Other Opening Protectives, 2016 Edition.
19. NFPA 253 - Critical Radiant Flux of Floor Covering Systems, 2015 Edition.
20. NFPA 2001 - Clean Agent Fire Extinguishing Systems (California Amended), 2015 Edition.
21. Americans with Disabilities Act (ADA), Title II.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 - 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 1 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. Related Sections include the following:
 - 1. Division 1 Section "Summary" for limitations on utility interruptions and other work restrictions.
 - 2. Division 1 Section "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
 - 3. Division 1 Section "Execution Requirements" for progress cleaning requirements.
 - 4. Other 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 USE CHARGES

- A. General: 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:
 - 1. Owner's existing sewer system is not available for use.
- C. Water Service:
 - 1. Owner's water service is available for use.
- D. Electric Power Service:
 - 1. Owner's electrical service is available for use.

- E. Sanitary Facilities:
 - 1. Pay sanitary service use charge for temporary toilets, wash facilities, and drinking water for use of construction personnel.

1.5 SUBMITTALS

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

1.6 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with 2019 CEC.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.7 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. Portable Chain-Link Fencing: Minimum 2-inch, 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide galvanized steel bases for supporting posts.

2.2 TEMPORARY FIELD OFFICES

- A. Not required.

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, electric, 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.

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.
 - 2. No power or water services are working at the project site. Power and water need to be brought to site as required for construction.
- B. Sewers and Drainage: Provide portable temporary utilities to remove effluent lawfully.
- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Sanitary Facilities: Install 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.
- E. Heating and Cooling: Install 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: Install 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: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
- H. Lighting: Install 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.

3.3 SUPPORT FACILITIES INSTALLATION

- A. 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.
- B. Parking: Provide temporary or use designated areas of Owner's existing parking areas if approved for construction personnel.
- C. 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.
- D. Project Identification and Temporary Signs: Provide Project identification. Install signs where directed to inform public and individuals seeking entrance to Project. Unauthorized signs are not permitted.
 - 1. Provide temporary, directional signs for construction personnel and visitors as necessary.
- E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 1 Section "Execution Requirements" for progress cleaning requirements.
- F. Temporary Use of Permanent Stairs: Cover finished, permanent stairs with protective covering of plywood or similar material so finishes will be undamaged at time of acceptance.

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 1 Section "Summary."

- B. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
 - 1. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- C. Stormwater Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- D. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- E. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
 - 1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations or as indicated on Drawings.
 - 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel.
- F. Install full coverage with green wind screen fabric to block viewing through construction fencing. Wind screen fabric shall be anchored or weighted sufficiently to resist design wind loads indicated on Drawings.
- G. 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.
- H. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- I. Temporary Enclosures: Provide temporary enclosures for protection of construction as necessary, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.
- J. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with 2019 CFC Article 87.
 - 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.
 - 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 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 1 Section "Closeout Procedures."

END OF SECTION 015000

SECTION 016000 - 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 1 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; and product substitutions.
- B. Related Sections include the following:
 - 1. Division 1 Section "References" for applicable industry standards for products specified.
 - 2. Division 1 Section "Closeout Procedures" for submitting warranties for Contract closeout.
 - 3. Other 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, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor. Proposed products by manufacturers not listed in Manufacturers list.
- C. Basis-of-Design: 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 "or equal" products of other named manufacturers.

- D. District Standard: Where a specific manufacturer's product is named and accompanied by the words "District Standard," 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 pre-selected by the District.
 - 1. District seeks to match products currently in use on other campuses; No substitution allowed.

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: Submit 3 copies of completed product list within days specified in General Conditions. 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 21 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 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. Substitution Request Form: Use form provided at end of Section.
 - 2. 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, that 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, environmental, 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. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
 - l. 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.
3. Architect's Action: Architect will notify Contractor of acceptance or rejection of proposed substitution within 21 days of receipt of request.
- 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. Named Product and Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section "Submittal Procedures." Show compliance with requirements.
- D. District Standard Products Specification Submittal: Comply with requirements in Division 1 Section "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Reference Standards:
1. 2019 California Building Standards Administrative Code, Part 1, Title 24 CBSC.
 2. 2019 California Building Code (CBC), Part 2, Title 24 CBSC. (2018 International Building Code of the International Code Council, with California Amendments).
 3. 2019 California Electrical Code (CEC), Part 3, Title 24 CBSC (2017 National Electrical Code, with California Amendments).
 4. 2019 California Mechanical Code (CMC), Part 4, Title 24 CBSC (2018 Uniform Mechanical Code, with California Amendments).
 5. 2019 California Plumbing Code (CPC), Part 5, Title 24, CBSC (2018 Uniform Plumbing Code, with California Amendments).
 6. 2019 California Energy Code, Part 6, Title 24 CBSC.
 7. 2019 California Historical Code, Part 8, Title 24 CBSC.
 8. 2019 California Fire Code, Part 9, Title 24 CBSC. (2018 International Fire Code, with California Amendments).

9. 2019 California Green Building Standards Code (CALGreen Code), Part 11, Title 24 CBSC.
10. 2019 California Referenced Standards Code, Part 12, Title 24, CBSC.
11. NFPA 13 - Automatic Sprinkler Systems (California Amended), 2016 Edition.
12. NFPA 14 - Standpipe Systems (California Amended), 2016 Edition.
13. NFPA 17 - Dry Chemical Extinguishing Systems, 2017 Edition.
14. NFPA 17A - Wet Chemical Extinguishing Systems, 2017 Edition.
15. NFPA 20 - Stationary Pumps, 2016 Edition.
16. NFPA 24 - Private Fire Service Mains (California Amended), 2016 Edition.
17. NFPA 72 - National Fire Alarm and Signaling Code (California Amended). 2016 Edition.
18. NFPA 80 - Fire Door and Other Opening Protectives, 2016 Edition.
19. NFPA 253 - Critical Radiant Flux of Floor Covering Systems, 2015 Edition.
20. NFPA 2001 - Clean Agent Fire Extinguishing Systems (California Amended), 2015 Edition.
21. Americans with Disabilities Act (ADA), Title II.

- B. 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.

1.6 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:
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.

1.7 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. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. 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 other sections for specific content requirements and particular requirements for submitting special warranties.
- C. Warranty Period: Warranty period specified in each sections are minimum requirements. Do not modify manufacturer's standard warranty period if the manufacturer's warranty has longer warranty period.
- D. Submittal Time: Comply with requirements in Division 1 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. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or an equal 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 "or equal".
6. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in Part 2 "Product Substitutions" Article to obtain approval by Architect for use of an unnamed product.
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.
 - a. If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product.
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 custom or 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 standard, custom, and premium items.

2.2 PRODUCT SUBSTITUTIONS

- A. Timing: Architect will consider requests for substitution if received within 35 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.
- B. 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 and has paid any fees.
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.
11. Furnish samples upon requested by Architect.
12. Attached Request for Substitution Form shall used for substitution requests.

PART 3 - EXECUTION

3.1 FORMS

- A. Electronic versions of attached forms will be provided upon request.
 1. Product List Form.
 2. Similar Installation List Form.
 3. Substitution Request Form.

END OF SECTION 016000

SUBSTITUTION REQUEST FORM

Substitutions are only allowed within number of days specified. Use this for m for requesting “or equal” products and materials.

Project:	Substitution Request Number:
	From:
To:	Date:
	Project Number:

Specification Section Title:		
Section Number:	Page:	Article/Paragraph:
Specified Item:		

Proposed Substitution:	
Manufacturer:	Address:
Contact Name:	Phone Number:
<input type="checkbox"/> Comparison between proposed substitution and specified product is attached. Note all differences.	

Reason for not using specified item:

- Specified product is no longer available.
- Substitution will improve lead time by _____ days
- Substitution will save Owner \$ _____
- Other:

- List 3 similar installations including project name, address, owner, and date installed is attached.
 Proposed substitution affects other parts of Work: No Yes; explanation attached.

Supporting Data Attached:

- Product Data (indicate any options to be included)
 Drawings Test Reports Samples Color Chart Other:

Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable is available.
- Proposed substitution will not affect or delay Construction Progress Schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including architectural or engineering design, detailing, and construction costs caused by the requested substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

- Substitutions for products or systems involving structural, fire/life safety and access compliance will require AHJ approval. This will add time required to review those substitutions requiring AHJ approval. Contractor is solely responsible for all documentation, cost, and time required to obtain AHJ approval.

Submitted by:	Firm:
Signature:	Date:
Comments:	

A/E Review:

- Approve Substitution.
- Approve Substitution as Noted.
- Reject Substitution. Use specified product.
- Reject Substitution. Use specified product. Substitution request received too late.

Signed by:	Date:
Comments:	

Owner's Review and Action (Approval of substitution is not valid without Owner's signature)

- Substitution approved.
- Substitution approved as Noted.
- Substitution rejected. Use specified product.

Signed by:	Date:
Comments:	

End of Substitution Request Form

SIMILAR INSTALLATION LIST FORM

Provide minimum 5 similar installations within last 3 years.

Project: _____ From: _____

To: _____ Date: _____

	Date of Installation	Project Name	Owner Info	GC Info	Architect info
1					
2					
3					
4					
5					
6					
7					
8					

End of Similar Installation List Form

SECTION 017300 - EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 1. General installation of products.
 2. Progress cleaning.
 3. Starting and adjusting.
 4. Protection of installed construction.
 5. Correction of the Work.
- B. Related Sections include the following:
 1. Division 1 Section "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
 2. Division 1 Section "Submittal Procedures" for submitting surveys.
 3. Division 1 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
 1. Before construction, verify the location and points of connection of utility services.
- B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas, and water-service piping; and underground electrical services.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.3 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
 4. Maintain minimum headroom clearance of 8 feet in spaces without a suspended ceiling.

- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.4 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.

2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.5 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section "Quality Requirements."

3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

- B. Provide protection against weather, rain, wind, storms, frost and heat so as to maintain all work and materials free from injury or damage.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

3.7 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 017300

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.
- B. Related Sections include the following:
 - 1. Division 1 Section "Temporary Facilities and Controls" for environmental-protection measures during construction.
 - 2. Division 2 Section "Selective Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvements.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Develop waste management plan that results in end-of-Project rates for salvage/recycling of 75 percent by weight of total waste generated by the Work.

1.5 QUALITY ASSURANCE

- A. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
 1. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
 2. Review requirements for documenting quantities of each type of waste and its disposition.
 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 5. Review waste management requirements for each trade.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work:
 1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until installation.
 4. Protect items from damage during transport and storage.
 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- B. Salvaged Items for Sale and Donation: Not permitted on Project site.
- C. Salvaged Items for Owner's Use:
 1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area designated by Owner.
 5. Protect items from damage during transport and storage.
- D. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.

3.2 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - 4. Store components off the ground and protect from the weather.
 - 5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.3 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION 017419

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Warranties.
 - 2. Extra Materials.
 - 3. Final cleaning.
- B. Related Sections include the following:
 - 1. Division 1 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
 - 2. Division 1 Section "Execution Requirements" for progress cleaning of Project site.
 - 3. Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 4. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 5. Division 1 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
 - 6. Other Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.

6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

1.4 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
 2. Submit certified copy of Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use form attached.
1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.

1.6 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date specified in General Conditions.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 - 2. Include Table of Contents.
 - 3. Identify content with specification section number and title.
 - 4. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 5. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

1.7 EXTRA MATERIALS

- A. Deliver to Owner's facility manager extra materials specified in each section.
- B. Organize submitted materials in orderly sequence based on the table of contents of the Project Manual.
 - 1. Itemize each material and quantity in 8-1/2 by 11-inch paper.
- C. Label each items for easy identification.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting IOR's inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - n. Replace parts subject to unusual operating conditions.
 - o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - q. Clean ducts, blowers, and coils if units were operated without filters during construction.
 - r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
 - s. Leave Project clean and ready for occupancy.

3.2 FORMS

- A. Electronic versions of attached forms will be provided upon request.
 - 1. Punch-List Form.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory.
 - 2. Emergency manuals.
 - 3. Operation manuals for systems, subsystems, and equipment.
 - 4. Maintenance manuals for the care and maintenance of products, materials, and finishes.
- B. Related Sections include the following:
 - 1. Division 1 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
 - 2. Division 1 Section "Closeout Procedures" for submitting operation and maintenance manuals.
 - 3. Division 1 Section "Project Record Documents" for preparing Record Drawings for operation and maintenance manuals.
 - 4. Other Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 SUBMITTALS

- A. Initial Submittal: Submit 2 draft copies of each manual at least 15 days before requesting inspection for Substantial Completion. Include a complete operation and maintenance directory. Architect will return 1 copy of draft and mark whether general scope and content of manual are acceptable.
- B. Final Submittal: Submit 1 copy of each manual in final form at least 15 days before final inspection. Architect will return copy with comments within 15 days after final inspection.

1. Correct or modify each manual to comply with Architect's comments. Submit 3 copies of each corrected manual within 15 days of receipt of Architect's comments.

1.5 COORDINATION

- A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Organization: Include a section in the directory for each of the following:
 1. List of documents.
 2. List of systems.
 3. List of equipment.
 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 MANUALS, GENERAL

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:
 1. Subject matter included in manual.
 2. Name and address of Project.

3. Name and address of Owner.
 4. Date of submittal.
 5. Name, address, and telephone number of Contractor.
 6. Name and address of Architect.
 7. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
 4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
 5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for each of the following:
1. Type of emergency.
 2. Emergency instructions.
 3. Emergency procedures.

- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 - 1. Fire.
 - 2. Flood.
 - 3. Gas leak.
 - 4. Water leak.
 - 5. Power failure.
 - 6. Water outage.
 - 7. System, subsystem, or equipment failure.
 - 8. Chemical release or spill.

- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

- D. Emergency Procedures: Include the following, as applicable:
 - 1. Instructions on stopping.
 - 2. Shutdown instructions for each type of emergency.
 - 3. Operating instructions for conditions outside normal operating limits.
 - 4. Required sequences for electric or electronic systems.
 - 5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 - 1. System, subsystem, and equipment descriptions.
 - 2. Performance and design criteria if Contractor is delegated design responsibility.
 - 3. Operating standards.
 - 4. Operating procedures.
 - 5. Operating logs.
 - 6. Wiring diagrams.
 - 7. Control diagrams.
 - 8. Piped system diagrams.
 - 9. Precautions against improper use.
 - 10. License requirements including inspection and renewal dates.

- B. Descriptions: Include the following:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Equipment identification with serial number of each component.
 - 4. Equipment function.
 - 5. Operating characteristics.
 - 6. Limiting conditions.
 - 7. Performance curves.
 - 8. Engineering data and tests.
 - 9. Complete nomenclature and number of replacement parts.

- C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
 2. Equipment or system break-in procedures.
 3. Routine and normal operating instructions.
 4. Regulation and control procedures.
 5. Instructions on stopping.
 6. Normal shutdown instructions.
 7. Seasonal and weekend operating instructions.
 8. Required sequences for electric or electronic systems.
 9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUAL

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Product Information: Include the following, as applicable:
1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
 2. Types of cleaning agents to be used and methods of cleaning.
 3. List of cleaning agents and methods of cleaning detrimental to product.
 4. Schedule for routine cleaning and maintenance.
 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
 - 1. Standard printed maintenance instructions and bulletins.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.
 - 6. Demonstration and training videotape, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original Project Record Documents as part of operation and maintenance manuals.
 - 2. Comply with requirements of newly prepared Record Drawings in Division 1 Section "Project Record Documents."
- G. Comply with Division 1 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
- B. Related Sections include the following:
 - 1. Division 1 Section "Closeout Procedures" for general closeout procedures.
 - 2. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 3. Other Sections for specific requirements for Project Record Documents of the Work in those Sections.

1.3 SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit 1 set of marked-up Record Prints.
- B. Record Specifications: Submit 1 copy of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit 1 copy of each Product Data submittal.
 - 1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.

1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an understandable drawing technique.
 - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations below first floor.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize Record Prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
5. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.
 4. Assemble in single binder with table of contents.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

3.2 FORMS

- A. Electronic versions of attached forms will be provided upon request.
 - 1. Record Product Data Form.

END OF SECTION 017839

SECTION 028100 - IRRIGATION SYSTEM

PART 1 - GENERAL

1.1 Scope of Work

- A. Furnish all labor, materials, and equipment necessary to complete the irrigation system work as indicated on the Drawings and specified herein.
- B. Test the entire irrigation system to assure proper operation.

1.2 Quality Assurance & Requirements

- A. **Manufacturer's Directions:** Manufacturer's directions and detailed Drawings shall be followed in all cases where the manufacturers of articles used in this Contract furnish directions covering points not shown in the Drawings and Specifications.
- B. **Ordinances and Regulations**
 - 1. All local, municipal and state laws, and rules and regulations governing or relating to any portion of this work are hereby incorporated into and made a part of these Specifications and their provisions shall be carried out by the Contractor. Anything contained in these Specifications shall not be construed to conflict with any of the above rules and regulations or requirements of the same. However, when these Specifications and Drawings call for or describe materials, workmanship, or construction of a better quality, higher standard, or larger size than is required by the above rules and regulations, the provisions of the Specifications and Drawings shall take precedence.
 - 2. Conform to all applicable sections of the local code.
 - 3. The materials and work of this section shall conform to all applicable provisions of the latest editions of the Uniform Plumbing Code, the California Electrical Code, and all codes properly governing the materials and work at the project site.
 - 4. All electrical materials and work shall conform with California Administrative Code, Title 23, Part 3, Basic Electrical Regulations, Article 18 E 110-16.

c. Explanation of Drawings

- 1. All offsets, fittings, sleeves; etc., which may be required are not indicated. Carefully investigate the structural and finish conditions affecting all of the work and plan the work accordingly furnishing such fittings; etc., as may be required to meet such conditions. Drawings are generally diagrammatic and indicative of the work to be installed. Due to the scale of the Drawings, it is not possible to indicate all offsets, fittings, sleeves, etc., which may be required to complete the irrigation system.
- 2. Before proceeding with any work, the Contractor shall check and verify all dimensions and quantities and shall immediately inform the Project Inspector of any discrepancy between the Drawing and/or the Specifications and actual conditions. No work shall be

done in any area where there is such a discrepancy until written approval for the same has been given by the Project Inspector. The Contractor shall assume full responsibility for work installed without approval.

3. The materials and work shall be installed in such a manner as to avoid conflicts between irrigation system and planting, existing or proposed utilities, and all other construction features.
4. Contractor shall verify prior to and during construction, that his contract documents reflect the latest revisions, change orders, and plan checks. Contractor shall be able to produce such documents at the request of the Project Inspector at any time during construction.
5. Pipe sizes indicated on the Drawings are minimum allowable.

1.3 Existing Conditions

- A. Contractor shall verify locations of all existing utilities, whether shown on plans or not. The Contractor shall notify members of U.S.A. two (2) working days in advance of performing any excavation work by calling the toll-free number 1-800-642-2444.
- B. Information on the Drawings relative to existing conditions is approximate only. Deviations found necessary during construction to conform to actual conditions, as approved by the Project Inspector, shall be made without additional cost.
- C. Exercise extreme care in excavating and working near existing utilities. Contractor shall be responsible for damages to existing utilities which are caused by his operation or neglect and shall pay all costs to repair or replace utilities damaged by his work.
- D. Contractor shall schedule site meeting with Project Inspector and Owner's Representation to review existing utilities and water stubs within the limits of the project.

1.4 Submittals

A. Material List

1. Contractor shall furnish the articles, equipment, materials, or processes specified by name in the Drawings and Specifications.
2. Complete material list shall be submitted prior to performing any work. Material list shall include the manufacturer, model number and description of all materials and equipment to be used.
3. Equipment or materials installed or furnished without prior approval of the owner shall be rejected and the Contractor required to remove such materials from the site at his own expense.
4. Approval of any item, alternate or substitute indicates only that the product or products apparently meet the requirements of the Drawings and Specifications on the basis of the information or samples submitted. The Contractor shall assume full responsibility (in

written form) for the performance of any substitutions. The owners decision for approval or rejection of any substitution is final.

B. As-Built/Record Drawings

1. The Contractor shall dimension from two (2) permanent points of reference, building corners, sidewalk, or road intersections, etc., the location of the following items:
 - a. Connection to existing water lines.
 - b. Connection to existing electrical power.
 - c. Routing of irrigation pressure lines (dimension maximum 100' along routing).
 - d. Sleeves
 - e. Irrigation control valves.
 - f. Routing for control wiring.
 - g. Other related equipment as directed by the Project Inspector.
2. On or before the date of the final observation, the Contractor shall deliver the corrected and completed set of reproducible mylars to the owner. Delivery of the mylars shall not relieve the Contractor of the responsibility of furnishing required information that may be omitted from the prints.

C. Controller Charts

1. Record Drawings shall be approved by the owner before controller charts are prepared.
2. Provide one (1) controller chart for each controller supplied.
3. The chart shall show by using a different color, the area controlled by each remote control valve. Chart shall be the maximum size which the controller door will allow.
4. The chart shall be a reduced drawing of the actual record drawing system. In the event the controller sequence is not legible which the drawing is reduced, it shall be enlarged to a size that is readable.
5. When completed and approved, the chart shall be hermetically sealed between two (2) pieces of plastic, each piece being a minimum ten (10) mils thick.
6. These charts shall be completed and approved prior to final observation of the irrigation system.

D. Operation and Maintenance Manuals

1. Prepare and deliver two (2) operation manuals as specified and as follows:
 - a. Catalog and parts sheets on every material and equipment installed under this contract. Include name, location and phone numbers of each product manufacturer and local representative.
 - b. Guarantee statement.
 - c. Complete operating and maintenance instructions on all major equipment.
2. In addition to the above mentioned operation and maintenance manuals, provide evidence in writing to the owner at the conclusion of the project that the above services have been rendered.

F. Equipment to be Furnished

1. Supply as a part of this Contract the following tools:
 - a. Two (2) sets of special tools required for removing, disassembling and adjusting each type of sprinkler and valve supplied on this project.
2. The above mentioned equipment shall be turned over to the Owner at the conclusion of the project, before final observation can occur.

1.5 Product Delivery, Storage And Handling

Handling of PVC Pipe and Fittings: The Contractor is cautioned to exercise care in handling, loading, unloading, and storing of PVC pipe and fittings. All PVC pipe shall be transported in a vehicle which allows the length of pipe to lie flat so as not to subject it to undue bending or concentrated external load at any point. Any section of pipe that has been dented or damaged will be discarded and if installed replaced with new.

1.6 Guarantee

- A. The guarantee for the irrigation system shall be one year from the date of final acceptance of the project.

PART 2 - PRODUCTS

2.1 Materials

- A. General: Use only new materials of brands and types noted on the Drawings specified herein or approved equals.

B. Backfill Material

1. Screened existing site material, as approved by the Project Inspector, shall be used for backfill material. Backfill material shall be free from organic materials, large clods of earth or rocks larger than one (1) inch diameter, trash, debris, rubbish, broken cement, asphalt material or other objectionable substances.
2. Imported backfill material, if required, shall be clean soil consisting of earth, sand, sandy clay, loam or other approved materials, with no large clods of earth or rocks larger than one-half (1/2) inch in size.
3. Sand bedding material shall be a fine granular sand material containing no foreign matter larger than one-half (1/2) inch in size.

C. Drainage Fill Material

1. Drainage fill material shall be three-quarter (3/4) inch washed, hard and durable, fragments of screened or broken stone or gravel.

D. Irrigation Pipe Sleeving

1. PVC Schedule 40 pipe size as required.

E. PVC Pressure Main Line Pipe and Fittings.

1. Pressure main line piping for sizes one-and one-half (1-1/2) inch and smaller shall be PVC Schedule 40 with solvent-welded joints.
 - a. Pipe shall be made from NSF approved Type I, Grade I, PVC compound conforming to ASTM resin specification D1785. All pipe shall meet requirements set forth in Federal Specification PS-21-70. (Solvent-weld Pipe).
2. Pressure main line piping for sizes two (2) inches and four (4) inches shall be PVC Class 315 with ductile iron joints.
 - a. Pipe shall be made from an NSF (National Sanitation Foundation) approved Type I, Grade I, PVC compound conforming to ASTM resin specification D1784. All pipe shall meet requirements as set forth in Federal Specification PS-22-70, with an appropriate standard dimension ratio (S.D.R./ Solvent-weld Pipe).
3. All PVC pipe shall be marked continuously and permanently with the following information: Manufacturer's name, nominal pipe size, schedule or class of pipe, pressure rating in P.S.I. extrusion, NSF approval and date of extrusion.
4. All fittings shall bear the manufacturer's name or trademark, material designation, size, applicable I.P.S. schedule and NSF seal of approval.
5. Trace wire shall be placed on top of pressure main line.

F. PVC Non-Pressure Lateral Line Piping

1. Non-pressure buried lateral line piping shall be PVC Class 200 with solvent-weld joints.
 - a. Pipe shall be made from NSF approved, Type I, Grade II, PVC compound conforming to ASTM resin specification D1784. All pipe shall meet requirements set forth in Federal Specification PS-22-70, with an appropriate standard dimension ratio.
2. PVC solvent-weld fittings for 2" or larger mainline, Class 315 mainline and Class 200 laterals shall be Schedule 40; all other solvent-weld fittings shall be Schedule 40, 1-2, II-I NSF approved conforming to ASTM D2466.
3. Solvent cement and primer for PVC solvent-weld pipe and fittings shall be of the type and installation methods specified by the manufacturers for each type of pipe.
4. All offsets shall be a minimum three-quarter (3/4) inch unless contractor receives written approval from the owner.

G. PVC Threaded Nipples: PVC Schedule 80

H. Control Wiring

1. Connections between the automatic controllers and the electric control valves shall be made with direct burial copper wire AWG-U.F. 600-volt. Pilot wires shall be a different color wire for each automatic controller. Common wires shall be white with a different

color stripe for each automatic controller. Install in accordance with valve manufacturer's specifications and wire chart. In no case shall wire size be less than #14.

2. All splices shall be made with 3M, DBY/DBR direct bury splice kit or Rainbird snap-tie wire connector, or approved equal. All connections shall be water tight.
- I. Control Wire Conduit
1. Gray PVC schedule 40 electrical conduit, ASTM F-512, size as required.
- J. Electric Remote Control Valve Assembly
1. All electric remote control valve and ball valve shall be of the same type, manufacturer and sizes as indicated on the Drawings and/or as specified herein or approved equal.
 2. All remote control valves shall have a manual flow adjustment.
- K. Electric Remote Control Valve Assembly Boxes
1. Control valve boxes shall be as noted on the plans, or approved equal. Install with bolt down lids and extensions if required.
 2. Control valve and ball valve shall be placed in individual boxes.
- L. Irrigation Heads and Nozzles
1. Shall be of the same manufacturer, type, size and deliver the same rate of precipitation with the same pressure, and discharge as indicated on Drawings and/or specified herein.
 2. Rotors shall be Hunter brand with factory installed check valves.
 3. Nozzles shall be Hunter brand as specified on the drawings.
- M. Controller Station Number Identification Tag:
1. Standard yellow I.D. tags by:
Christy Enterprises
1207 W. Struck Avenue
Orange, California 92667
(717) 771-4142
(800) BLU-GLUE

PART 3 - EXECUTION

3.1 Observation of Site

A. Site Conditions

1. All scaled dimensions are approximate. The Contractor shall check and verify all site dimensions and notify the Project Inspector if site conditions have changed.
2. The Contractor shall carefully check all grades to satisfy himself that he may safely proceed before starting work on the irrigation system.

3.2 Preparation

A. Physical Layout

1. Prior to installation, the Contractor shall stake out all pressure supply lines, routing and location of sprinkler heads.
2. All layout shall be approved by the Project Inspector prior to installation. If equipment is incorrectly located without said approval, it is the Contractor's responsibility to relocate it as per the Project Inspector's directions without additional cost.

3.3 Water And Electrical Services

A. Water Supply

1. Irrigation system shall be connected to the new water supply point of connection as indicated on the Drawings. Field verify connection point. Contractor is responsible for any changes caused by actual site conditions. Notify Project Inspector in writing of any discrepancies prior to beginning construction.
2. Attach trace wire to mainline.
3. Contractor shall verify available flow and pressure. Notify Project Inspector if actual flow and pressure differ from what is shown on the Drawings.

B. Electrical Supply

1. Contractor shall provide all materials and connections to supply electrical power for irrigation controllers.
2. Connection shall be made at approximate location(s) where irrigation controllers are shown on the drawings. The Contractor is responsible for minor changes caused by actual site conditions and for the coordination of all electrical service connections to the controllers with other trades.
3. All electrical work and materials shall conform to local codes, ordinances and governing authorities having jurisdiction.

3.4 Installation

A. Trenching

1. Dig trenches straight and support pipe continuously on bottom of trench. Lay pipe to an even grade. Trenching excavation shall follow layout indicated on the Drawings and as noted.
2. Provide for a minimum of eighteen (18) inches cover for all pressure lines.
3. Provide for a minimum of twelve (12) inches cover for all non-pressure lines.

4. Provide for a minimum of eighteen (18) inches cover for all control wiring.

B. Backfilling

1. The trenches shall not be backfilled until all required tests are performed. Trenches shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall be mechanically compacted in landscaped areas to a dry density equal to adjacent undisturbed soil in planting areas. Backfill shall conform to adjacent grades without dips, sunken areas, humps or other surface irregularities.
2. Where excavated native soil contains greater than 50% rock or other material one (1) inch diameter or larger, import clean backfill or sand bedding shall be placed three (3) inches in depth around all pipes.
3. If settlement occurs and subsequent adjustments in pipe, valves, drip or planting, or other construction are necessary, the Contractor will make all the required adjustments without cost to the Owner.

C. Trenching and Backfilling Under Paving

1. Trenches located under areas where paving, asphaltic concrete or concrete shall be installed, shall be backfilled with sand (a layer six (6) inches below the pipe and three (3) inches above the pipe and compacted in layers to 90% compaction, using manual or mechanical tamping devices). All trenches shall be left flush with the adjoining grade. The Contractor shall set in place, cap and pressure test all piping under paving prior to the paving work.
2. Generally piping under existing walks is done by jacking, boring or hydraulic driving, but where any cutting or breaking of sidewalks and/or concrete is necessary, it shall be done and replaced by the Contractor as part of the Contract cost. Permission to cut or break sidewalks and/or concrete shall be obtained from the Owner. No hydraulic driving shall be permitted under concrete paving.

D. Sleeving

1. Install all irrigation and/or electrical sleeving as indicated on the Drawings. Contractor shall coordinate the installation of sleeving with the work of other trades.

E. PVC Pipe

1. Routing of irrigation pipe as indicated on the Drawings is diagrammatic. Install lines and various assemblies to conform with the details shown on the Drawings.
2. PVC pipe and fittings shall be thoroughly cleaned of dirt, dust and moisture before installation. Installation and solvent welding methods shall be as recommended by the pipe and fitting manufacturer.
3. PVC pipe shall be installed so that there will be a small amount of excess length in the pipe to compensate for contraction and expansion of the pipe. This shall be accomplished by "snaking" the pipe in the trench during installation.

F. Ductile iron joints

1. Ductile iron joints to be installed per manufacturers specifications. Contractor to be familiar and have experience with installation of irrigation systems using ductile iron fittings.

G. Line Clearance

1. All lines shall have a minimum clearance of three (3) inches from each other and twelve (12) inches from lines of other trades. Parallel lines shall not be installed directly over one another.

H. Automatic Controller

1. Controller shall be the make and model as specified on the plans.
2. Connect station valves, common and master valve wires to appropriate terminals per manufacturer's specification.
3. The Contractor shall take all control wires to the controller and make all required connections for their installation.
4. All electrical and control wires installed above ground shall be placed in metal conduit or other approved materials and securely mounted. Paint conduit to match building color.

I. Control Wiring

1. Wiring shall occupy the same trench and shall be installed along the same route as pressure supply or lateral lines wherever possible.
2. Where more than one (1) wire is placed in a trench, the wiring shall be taped together at intervals of ten (10) feet.
3. An expansion curl shall be provided within three (3) feet of each wire connection. Expansion curl shall be of 18 inches in length at each splice connection and at each electric control, so that in case of repair, the valve bonnet may be brought to the surface without disconnection of the control wires. Control wires shall be laid loosely in trench without stress or stretching of control wire conductors.
4. All control wire spliced shall be completely waterproof. Use one splice per connector sealing pack.
5. Size of wire shall not exceed manufacturer's length of run charts.

J. Electric Remote Control Valves

1. Install as per the irrigation details and manufacturer's specifications.
2. Install where shown on Drawings. Locate valve boxes 12 inches from walk, curb, headerboard, etc., for easy access.

3. Install one (1) remote control valves per valve box. Provide extension units as required. Install valve boxes in shrub planting areas whenever possible.
4. Provide eighteen (18) inch expansion loop at all electrical connections within control valve boxes.

K. Flushing of System

1. After all new irrigation pipe lines and risers are in place and connected, all necessary diversion work is complete, and prior to installation of irrigation heads, the control valves shall be opened and a full head of water shall be used to flush out the system.

L. Controller Station Number Identification Tags: fasten securely to each control valve.

M. Sprinklers

1. Sprinklers and nozzles shall be the make and model as indicated on the drawings. install per manufacturers specifications.
2. Flush the pipe for each hydrozone prior to installation of nozzles.
3. Adjust radius and degree pattern to provide head-to-head coverage and to minimize overspray onto adjacent areas.

3.5 Field Quality Control

A. Adjustment of the System

1. The Contractor shall adjust all pressure regulating devices on the remote control valves.
2. The Contractor shall flush and adjust all irrigation for optimum performance and to prevent run-off onto walks, hardscape, roadways, and buildings.
3. If it is determined that adjustments in the irrigation equipment shall provide proper and more adequate coverage, the Contractor shall make such adjustments after written approval by the Project Inspector. Adjustments shall include changes and additions of drip lines, emitters, etc. as required without additional contract costs.
4. If it is determined that any irrigation equipment is improperly installed, then adjustments shall be made to conform to construction documents without additional contract costs.

B. Testing of Irrigation System

1. The Contractor shall request the presence of the Project Inspector at least 48 hours in advance of testing.
2. Test all pressure lines under hydrostatic pressure of 125 pounds per square inch prior to installation of remote control valves.
3. Sustain pressure in lines for not less than two (2) hours. If leaks develop, replace joints and repeat test until entire system is proven watertight. At the end of the test the system shall be drained in the presence of the owner.

5. All hydrostatic tests shall be made only in the presence of the Project Inspector. Center load pipe in trench exposing all joints for pressure test. No pipe shall be backfilled until it has been observed, tested and approved in writing by the Project Inspector. Should any work be covered up before such observation and tests are completed, the Contractor shall, at his own expense, uncover the work; and after it has been observed, tested and approved, he then shall make all repairs with such materials as required to restore all work disturbed to original and proper condition.
6. Furnish necessary force pump and all other test equipment. All equipment shall be present during the test.

3.6 Maintenance

Provide maintenance as per SECTION 0297000 - LANDSCAPE MAINTENANCE.

3.7 Clean-Up and Observation Prior To Final Acceptance

- A. Clean-up shall be made as each portion of work progresses. Refuse and excess dirt shall be removed from site. All walks and paving shall be broomed or washed down, and any damage sustained to the work of others shall be repaired to original conditions acceptable to the Owner.
- B. The Contractor shall operate each system in its entirety for the owner at time of final observation. Any items deemed not acceptable shall be reworked at no additional contract cost, to the complete satisfaction of the owner.

END OF SECTION

SECTION 029500 - PLANTING INSTALLATION

PART I - GENERAL

1.02 Scope Of Work

- A. Furnish all labor, material, equipment and services necessary to provide all landscape work, complete in place, as indicated on Drawings and specified herein.

Work specified in this Section, but is not limited to the following:

1. Soil preparation
2. Sod installation
3. Clean-up

1.02 Quality Assurance

A. Source Quality Control

1. Submit documentation to the Project Inspector at least thirty (30) days prior to start of planting that all plant material has been ordered. Arrange procedure for observation of plant material with the Project Inspector at time of submission.
2. Plants shall be subject to observation and approval of the Project Inspector upon delivery for conformity to specifications. Such approval shall not impair the right of observation and rejection during progress of the work.

1.04 Product Delivery, Storage And Handling

A. Delivery

1. The Contractor, upon request by the Project Inspector, shall provide receipts, delivery tickets, load tickets, etc. of all items delivered to the job site to verify products and total quantities.
2. Deliver fertilizer to site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name trademark, and conformance to State Law.
3. Deliver plants with legible identification labels.
 - a. Label sod with tags from supplier for easy identification.
 - b. State correct plant name and size indicated on plant list.
 - c. Use durable waterproof labels with water-resistant ink which will remain legible for at least sixty (60) days.
4. Protect plant material during delivery to prevent damage to rootball or desiccation of leaves.

5. The Contractor shall notify the Project Inspector forty-eight (48) hours in advance of delivery of all plant materials for observation.

B. Storage

1. Store plant material in shade and protect from weather.
2. Maintain and protect plant material.

C. Handling

1. Do not drop plant materials.
2. Do not pick up container plant material by stems or trunks.

1.05 Job Conditions

- A. Planting: Perform actual planting only when weather and soil conditions are suitable in accordance with locally accepted practice.
- B. Scheduling: Install sod areas after irrigation system is operable.
- C. Protect work and materials from damage due to construction operations by other trades and vandalism. Maintain protection during construction and maintenance period.

1.06 Samples And Tests

The Project Inspector reserves the right to take and analyze samples of materials for conformity to specifications at any time; the Contractor shall furnish samples upon request by Project Inspector. Rejected materials shall be immediately removed from the site at the Contractor's expense. Cost of testing of materials not meeting specifications shall be paid by the Contractor.

1.07 Guarantee And Replacement

- A. All plant material and other materials installed under the Contract shall be guaranteed against any and all poor, inadequate or inferior materials and/or workmanship during installation and the maintenance period. Any sections of sod found to be dead or not in a satisfactory or healthy condition due to faulty materials, workmanship, or improper maintenance as determined by the Project Inspector, shall be replaced by the Contractor at his expense.
- B. Any materials found to be dead, missing or not in a satisfactory or healthy condition during the maintenance period shall be replaced immediately. The Project Inspector shall be the sole judge as to the condition of material. Material to be replaced within the guarantee period shall be replaced by the Contractor within fifteen (15) days of written notification by the Owner. All replacement materials and installation shall comply to the Drawings and the Specifications.

1.08 Submittals

The Contractor shall submit to the Owner's representative two (2) representative samples of sod, infield mix, soils fertility report, soil amendments (per soils report) with current (within the last 60 days) analytical data for approval by Owner's representative prior to any delivery of any of the above mentioned materials to the project site.

PART 2 - PRODUCTS

2.01 General

All materials shall be of standard, approved and first-grade quality and shall be in prime condition when installed and accepted. Any commercially processed or packaged material shall be delivered to the site in the original unopened container bearing the manufacturer's guaranteed analysis. The Contractor shall supply the Project Inspector with a sample of all supplied materials accompanied by analytical data from an approved laboratory source illustrating compliance of bearing the manufacturer's guaranteed analysis.

2.02 Products

A. Soil Conditioner (for bidding purposes only).

1. Gro-Power Plus or approved equal: Humus (bacteria included based fertilizer and soil conditioner with soil penetrant shall consist of the following percents by weight:

5 %	nitrogen
3 %	phosphoric acid
1 %	potash
50 %	humus
15 %	humic acids

B. Soil Amendment (for bidding purposes only).

1. Base Bid soil amendment shall be:
 - a. Nitrogen Stabilized Recycled Compost "Super Humus": 0.56 to 0.84% N based on dry weight, treated with relative form of nitrogen (NH₃).
 - 1) Particle Size: 95% - 100% passing 6.35 mm standard sieve.
80% - 100% passing 2.33 mm standard sieve.
 - 2) Salinity: The saturation extract conductivity shall not exceed 3.5 millimhos/centimeter at 25 degrees (25°) centigrade as determined by saturation extract method.
 - 3) Iron Content: Minimum 0.08% dilute acid soluble Fe on dry weight basis.
 - 4) Ash: 0 - 6.0% (dry weight)
 - 5) Acidity range (pH) shall be between 5.5 and 7.5.
 - 6) Actual organic content shall be a minimum 280 pound (lbs.) per cubic yard.

C. Fertilizer (for bidding purposes only)

1. Planting Pit Fertilizer: Shall be Gro-Power Plus (bacteria included) with soil penetrant and shall consist of the following percents by weight:

- 5% nitrogen
- 3% phosphoric acid
- 1% potash
- 50% humus
- 15% humic acid

2. Turf Starter Fertilizer: Shall consist of the following percents by weight:

- 12% nitrogen
- 20% phosphoric acid
- 0% potash

3. Planting Tablets: Slow-release 21 gram tablets as manufactured by Agriform, containing the following percentages of nutrients by weight:

- 20% nitrogen
- 10% phosphoric acid
- 5% potash

4. Soil Amendment NPK Fertilizer: Shall consist of the following percents by weight:

- 6% nitrogen
- 20% phosphoric acid
- 20% potash

D. Sod Lawn

1. Provide fresh, clean, new sod lawn. Furnish to Owner dealers guaranteed statement of composition of sod mixture.

E. Infield Mix

1. Infield mix to be provided as specified on the plans.
2. Provide 1-gallon samples of infield mix to district for review and approval.

PART 3 - EXECUTION

3.01 Observation

- A. Verify that final grades have been established prior to beginning planting operations. Inspect trees, shrubs and liner stock plant material for injury, insect infestation and trees and shrubs for improper pruning. Do not begin planting of trees until deficiencies are corrected or plants replaced.

3.02 Preparation

- A. The irrigation system shall be operational and approved prior to planting.
- B. All lawn areas shall be weed free at the time of sod material installation.

3.03 Installation

A. Preparation of Planting Area

1. After approximate finished grades have been established, soil amendments shall be added per the recommendations of the soils report as noted on the plans. Amendments shall be uniformly spread and cultivated thoroughly by means of mechanical tiller into the top six (6) inches of soil.

Application Rates (for bidding purposes only):

- a. One hundred fifty (150) lbs. of soil conditioner per 1,000 square feet.
 - b. Three (3) cubic yards of soil amendment per 1,000 square feet.
 - c. One hundred thirty (130) pounds of limestone per 1,000 square feet.
 - d. Soil Amendment NPK Fertilizer at a rate of 15 lbs. per 1,000 square feet.
2. All soil areas shall be compacted and settled by application of irrigation to a minimum depth of eight (8) inches.
 3. At time of planting, the top six (6) inches of all areas to be planted shall be free of stones, stumps, or other deleterious matter one (1) inch in diameter or larger, and shall be free from all debris, or similar objects that would be a hindrance to planting and maintenance.
 4. Soil Tests: A soils report shall be prepared as noted on the plans. Actual soil amendments shall be provided per the recommendations of the soil test and report.

B. Final Grades

1. Finished grading shall insure proper drainage of the site.
2. Finish grades shall be as noted on the civil plans.
3. Surface drainage shall be away from all building foundations.
4. Dispose of excess or unacceptable soil from the site.

3.04 Plant Installation

A. General

1. Actual planting shall be performed during those periods when weather and soil conditions are suitable and in accordance with locally accepted practice, as approved by the Project Inspector.
2. Only as many plants as can be planted and watered on that same day shall be distributed in a planting area.
3. Container shall be opened and plants shall be removed in such a manner that the ball of earth surrounding the roots is not broken and they shall be planted and watered as herein

specified immediately after removal from the containers. Containers shall not be opened prior to placing the plants in the planting area.

B. Sod

1. Sod variety shall be as specified on Drawings. Sod shall be healthy, weed free and obtained from a certified sod growing nursery or farm.
2. All sod shall be cut within twenty-four (24) hours prior to installation.

C. Weed Control

1. Apply weed control to all non-turf areas after completion of all planting and one (1) complete watering (to "set" plants). Apply as per manufacturer's specifications.

3.05 Clean Up

After all planting operations have been completed, remove all trash, excess soil, empty plant containers or rubbish from the property. All scars, ruts or other marks in the ground caused by this work shall be repaired and the ground left in a neat and orderly condition throughout the site. Contractor shall pick up all trash resulting from this work no less frequently than each Friday before leaving the site, once a week, and/or the last working day of each week. All trash shall be removed completely from the site. The Contractor shall leave the site area broom-clean and shall wash down all paved areas within the Contract area, leaving the premises in a clean condition acceptable to Owner and Project Inspector.

3.06 Observation Schedule

- A. The Contractor shall be responsible for notifying the Project Inspector in advance for the following observations according to the time indicated:
1. Plant layout review - 48 hours.
 2. Soil preparation and planting operations. One (1) tree with each type of specified staking shall be approved prior to planting of trees - 48 hours.

3.07 Landscape Maintenance

Provide Landscape Maintenance as per SECTION 02970 - LANDSCAPE MAINTENANCE.

END OF SECTION

SECTION 029700 - LANDSCAPE MAINTENANCE

PART 1 - GENERAL

1.1 Scope of Work

- A. Furnish all labor, material, equipment and services required to maintain landscape in a healthy growing condition and in a neat and attractive appearance throughout the maintenance period.

1.2 Quality Assurance

- A. The Maintenance Contractor shall be experienced in horticulture and landscape maintenance, practices and techniques, and shall provide sufficient number of workers with adequate equipment to perform the work during the maintenance period.

1.3 Maintenance Period

- A. Continuously maintain the entire project area during the progress of the work and during the ninety (90) working days, maintenance period or until final acceptance of the project by the Owner.
- B. Maintenance period shall not start until all elements of construction, planting and irrigation for the entire project are in accordance with Plans and Specifications. A prime requirement is that all lawn and landscape areas shall be planted and that all lawn areas shall show an even, healthy stand of grass seedlings which shall have been mown twice. If such criteria is met to the satisfaction of the project inspector, a written notification shall be issued to establish the effective beginning date of maintenance period.
- C. Any day of improper maintenance, as determined by the project inspector, shall not be credited as an acceptable maintenance period day. The maintenance period shall be extended on a daily basis if the work is not in accordance to the Plans and Specifications.
- D. Maintenance shall continue beyond the ninety (90) working days maintenance period, as required, until final acceptance is given by the Owner.
- E. Contractor shall provide protection to the project site during the maintenance period.

1.4 Guarantee and Replacement

- A. All plant material and other materials installed under the Contract shall be guaranteed for the duration of the landscape maintenance period against any and all poor, inadequate or inferior materials and/or workmanship or improper maintenance, as determined by the project inspector, shall be replaced by the Contractor at his expense.
- B. Any materials found to be dead, missing, or not in a satisfactory or healthy condition during the maintenance period shall be replaced immediately. The project inspector shall be sole judge as to the condition of material. Material to be replaced within the guarantee period

shall be replaced by the Contractor within five (5) days of written notification by the Owner. All replacement materials and installations shall comply to the Plans and Specifications. Any plant missing due to suspected theft shall be replaced by the Contractor. If the Contractor suspects that theft may be a problem, the Contractor shall provide written documentation to the Owner that security on this site needs to be intensified. The Contractor may relieve himself of theft responsibility if after the security notice, with no result, a written notice to the Owner shall be given that plant material will not be replaced for theft or vandalism due to lack of site security being maintained. This procedure may take place only during the Landscape Maintenance Period.

1.5 Final Acceptance of The Project

- A. Upon completion of all project work, including maintenance period, the Project Inspector will, upon proper request, make an observation to determine final project acceptability.
- B. Where observed work does not comply with the Plans and Specifications, replace rejected work and continue specified maintenance period until reinspected by the Project Inspector and determined to be acceptable. All replacement materials and installations shall be in accordance with the Plans and Specifications. Remove rejected work and materials immediately from project. Prior to the date of final observation, Contractor shall provide the Owner with all Record Drawings and written Guarantee Statement in accordance with the Plans and Specifications.

PART 2 - PRODUCTS

2.1 Materials

- A. All materials used shall be typical for landscape maintenance practice.
- B. Maintenance fertilizer shall be per the recommendations of the soils report.

PART 3 - EXECUTION

3.1 Maintenance

- A. Maintenance shall be according to the following standards. All areas shall be weeded and cultivated at intervals of not more than seven (7) days. Watering, trash and debris removal, mowing, rolling, edging, trimming, fertilization, spraying and pest control, as required, shall be included in the maintenance period. Street gutters and sidewalks shall be included. The Contractor shall be responsible for maintaining adequate protection of the area. Damaged areas shall be repaired at the Contractor's expense. Between the 15th day and the 20th day of the maintenance period, the Contractor shall reseed or resod all spots or areas within the lawn where normal turf growth is not evident.
- B. During course of maintenance, excess and waste materials shall be continuously and promptly removed at end of each workday.

- C. Water in such manner and as frequently as is deemed necessary by Owner to assure continued growth of healthy grass. Water areas of site in such a manner as to prevent erosion due to excessive quantities applied over small areas and to avoid damage to finished surface due to watering equipment.

3.2 Mowing and Edging

1. Mowing of turf will commence when the grass has reached a height of two inches. The height of cut will be 1 to 1-1/2". Mowing will be at least weekly after the first cut. Turf must be well-established and free of bare spots and weeds to the satisfaction of the Landscape Architect prior to final acceptance.
2. Grass clippings shall be picked up and removed from the site and premises in a legal manner.
3. Edges shall be trimmed at least twice monthly or as needed for neat appearance. Clippings shall be removed from paved areas and planting areas and removed from the site.

B. Watering

1. Lawns shall be watered at such frequency as weather conditions require to replenish soil moisture below root zone and to establish healthy stands of turf.

C. Weed Control

Control broad leaf weeds with selective herbicides. In areas where crabgrass has infested the lawn, apply pre-emergent herbicides such as Dacthal, Balan, or Betasan for control prior to crabgrass germination.

D. Fertilization

During maintenance period an application of general fertility maintenance fertilizer, as specified, shall be made at thirty (30) days and again at sixty (60) days from the date of lawn installation at a rate of five (5) pounds per 1,000 square feet. At the end of the maintenance period apply slow release fertilizer at a rate of ten (10) pounds per 1,000 square feet or as per soils report recommendations.

E. Replacement

At conclusion of maintenance period a final observation of turf areas shall be made. Remove diseased areas and unhealthy stands of grass from the site; do not bury into the soil. Replant areas with materials and in a manner as specified on the Plans and Specifications at no additional cost to the Owner.

3.5 Irrigation System

A. System Observation

The Contractor shall check all systems for proper operation. Lateral lines shall be flushed out by removing the last sprinkler head at each end of the lateral. All heads are to be adjusted as necessary for unimpeded, head to head coverage.

B. Controllers

Set and program automatic controllers for seasonal water requirements. Give the Owner's representative instructions on how to turn off system in case of emergency.

C. Repairs

Repair all damages to irrigation system at the Contractor's expense. Repairs shall be made within twenty-four (24) hours.

END OF SECTION

SECTION 323113 - CHAIN-LINK FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Chain-Link Fences: Industrial.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide chain-link fences capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Determine minimum post size, group, and section according to ASTM F 1043 for framework up to 12 feet high, and post spacing not to exceed 10 feet.

1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences.
 - 1. Fence posts, rails, and fittings.
 - 2. Chain-link fabric, reinforcements, and attachments.
- B. Shop Drawings: Show locations of fences, posts, rails, tension wires, details of extended posts, and accessories. Indicate materials, dimensions, sizes, weights, and finishes of components. Include plans, elevations, sections, details of post anchorage, attachment, bracing, and other required installation and operational clearances.
- C. Product Certificates: For each type of chain-link fence, signed by product manufacturer.
 - 1. Strength test results for framing according to ASTM F 1043.
- D. Qualification Data: For Installer.
- E. Maintenance Data: For the following to include in maintenance manuals:

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed chain-link fences similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

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

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify layout information for chain-link fences shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.
- B. Interruption of Existing Utility Service: Do not interrupt utility services to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Architect no fewer than 2 days in advance of proposed interruption of utility services.
 - 2. Do not proceed with interruption of utility services without Architect's written permission.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of chain-link fences that fails in materials or workmanship within specified warranty period.
 - 1. Warranty Period: 2 years.
- B. Installer's Warranty: 1 year.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Chain-Link Fences: Subject to compliance with requirements, provide products by one of the following.
 - 1. Master-Halco.
 - 2. Ameristar.
 - 3. Anchor Fence.
 - 4. Merchants Metals.
 - 5. Swan Fence Inc.
 - 6. Or equal.

2.2 CHAIN-LINK FENCE FABRIC

- A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist. Comply with ASTM A 392, CLFMI CLF 2445, and requirements indicated below:
 - 1. Steel Wire Fabric: Metallic-coated wire with 9 gage (0.144 inches) core thickness.
 - a. Mesh Size: 2 inches.
 - b. Weight of Metallic (Zinc) Coating: ASTM A 392, Type II, Class 2, 2.0 oz./sq. ft. with zinc coating applied after weaving.
 - 2. Selvage: Knuckled at both selvages.

2.3 INDUSTRIAL FENCE FRAMING

- A. Posts and Rails: Comply with ASTM F 1043 for framing, and the following:
1. Group: Group IC round high yield pipe, ASTM F 1043, domestic (not imported) Deluxe Quality (DQ-40) Industrial (not Schedule 40).
 2. Fence Height: As indicated on Drawings.
 3. Strength Requirement: Heavy industrial according to ASTM F 1043.
 4. Post Diameter and Thickness:
 - a. Top and Bottom Rail: 1-5/8 inch O.D. (nominal 1-1/4 inch).
 - b. Terminal Post (Corner, End, and Gate Post): 2-7/8 inch O.D. (nominal 2-1/2 inch).
 - c. Line and Brace Rail: 1-7/8 inch O.D. (nominal 1-1/2 inch).
 - d. Swing Gate Members: 1-7/8 inch O.D. (nominal 1-1/2 inch).
 5. End and Corner Post Top: Dome.
 6. Coating for Steel Framing:
 - a. Metallic Coating:
 - 1) Type A, consisting of not less than minimum 2.0-oz./sq. ft. average zinc coating per ASTM A 123 or 4.0-oz./sq. ft. zinc coating per ASTM A 653.
 - 2) Type B, zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film.
 - 3) External, Type B, zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film. Internal, Type D, consisting of 81 percent, not less than 0.3-mil- thick, zinc pigmented coating.
 - 4) Type C, Zn-5-Al-MM alloy, consisting of not less than 1.8-oz./sq. ft. coating.
 - 5) Coatings: Any coating above.
 - b. Polymer Coating:
 - 1) ASTM D 668, Class 2b, fluidized PVC bonded and cured onto metallic-coated steel wire.
 - 2) Color: As selected by Architect from manufacturer's full range, complying with ASTM F 934.

2.4 TENSION WIRE

- A. General: Provide horizontal tension wire at the following locations:
1. Location: Extended along bottom of fence fabric and along top when either top or bottom rails are not indicated on Drawings.
- B. Metallic-Coated Steel Wire: Minimum 0.177-inch- diameter, marcelled tension wire complying with ASTM A 817, ASTM A 824, and the following:
1. Metallic Coating: Matching chain-link fabric coating type and weight.

2.5 FITTINGS

- A. General: Comply with ASTM F 626.

2.7 CAST-IN-PLACE CONCRETE

- A. Materials: Portland cement complying with ASTM C 150, Type I aggregates complying with ASTM C 33, and potable water for ready-mixed concrete complying with ASTM C 94.
 - 1. Concrete Mixes: Normal-weight concrete with not less than 3000-psi compressive strength (28 days), 3-inch slump, and 1-inch maximum size aggregate.

2.8 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by manufacturer, for exterior applications.

2.9 POLYMER FINISHES

- A. Supplemental Color Coating: In addition to specified metallic coatings for steel, provide fence components with polymer coating.
- B. Metallic-Coated Steel Tension Wire: PVC-coated wire complying with ASTM F 1664, Class 2b.
- C. Metallic-Coated Steel Framing and Fittings: Comply with ASTM F 626 and ASTM F 1043 for polymer coating applied to exterior surfaces and, except inside cap shapes, to exposed interior surfaces.
 - 1. Polymer Coating: Not less than 10-mil- thick PVC or 3-mil- thick polyester finish.
- D. Color: Match chain-link fabric, complying with ASTM F 934.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for a verified survey of property lines and legal boundaries, site clearing, earthwork, pavement work, and other conditions affecting performance.
 - 1. Do not begin installation before final grading is completed, unless otherwise permitted by Architect.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Stake locations of fence lines and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.3 INSTALLATION, GENERAL

- A. Install chain-link fencing to comply with ASTM F 567 and more stringent requirements specified.

3.4 CHAIN-LINK FENCE INSTALLATION

- A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- B. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
 - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
 - 2. Concrete Fill: Place concrete around posts and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
 - a. Hole diameter dug or drilled minimum 4 times largest cross section of post and minimum depth of 24 inches plus additional 3 inch for each 1 foot increase in fence height over 4 feet.
 - b. Exposed Concrete: Extend 2 inches above grade; shape and smooth to shed water.
- C. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more.
- D. Line Posts: Space line posts equidistant at intervals not exceeding 10 feet o.c unless otherwise indicated.
- E. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Install braces at end and gate posts and at both sides of corner and pull posts.
 - 1. Locate horizontal braces at midheight of fabric 6 feet or higher, on fences with top rail and at 2/3 fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.
- F. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch- diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches o.c. Install tension wire in locations indicated before stretching fabric.
 - 1. Top Tension Wire: Install tension wire through post cap loops.
 - 2. Bottom Tension Wire: Install tension wire within 6 inches of bottom of fabric and tie to each post with not less than same diameter and type of wire.
- G. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
- H. Bottom Rails: Install, spanning between posts.
- I. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 2 inches between finish grade or surface, unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

- J. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15 inches o.c.
- K. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at 1 end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.
 - 1. Maximum Spacing: Tie fabric to line posts at 12 inches o.c. and to braces at 24 inches o.c.
- L. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

END OF SECTION 323113