CONSTRUCTION SPECIFICATIONS

VISTA UNIFIED SCHOOL DISTRICT

Mission Vista High School
Theater- Audio Video Upgrade Project

Mission Vista High School
1306 Melrose Drive, Oceanside Ca 92057

September 13, 2024

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1.02 WORK COVERED BY CONTRACT DOCUMENTS:

A. Work Included: The work to be performed by this Prime Contractor shall conform to the requirements of all of Division 00 and Division 01 as well as the Project Performance Specifications (Division 02 through 33), all sheets in Drawings and other related documents (addenda), and includes the furnishing of all supervision, labor, materials, tools, equipment, transportation, plan and services necessary therefore and incidental thereto to complete the project. If Reference is not made to a specific specification section, this does not relieve this prime contractor of his material obligation for specification sections that pertain to his work and are not mentioned herein. The work shall consist of, but not be limited to the following project procedures/scope:

1. The Audio/Visual Contractor is to accurately furnish, install and provide all Audio/Visual scope of work for the entire project per the plans and specifications, including but not necessarily limited to the following: Installation of Audio/Video equipment and components as specified in the bid documents to include:

1. Electrical outlets behind each of the video monitors as well as in the three upstaged floor pockets. A point of view camera in the back of the theater audience area. All hardware or materials necessary to complete the work, including, but not limited to mounting brackets, cabling, connectors, wire ties, tie bases, panduit, wire ways, or conduit as necessary to provide a clean, neat, and professional installation. All required seismic restraints following local building codes and regulations. This requirement includes but is not limited to the rack, and theater speakers. The scope of work is inclusive of installation, continuity (“copper testing”), and related warranties slash guarantees as described in these specifications.

2. Inspections: Inspections require 48-hour minimum advance notification for onsite IOR and 72 hours for special inspections.

3. Audio/Video contractor shall examine all drawings and specifications before executing the work. Audio/ Video contractor shall verify electrical power requirements conduits raceways and boxes and report any discrepancies and or conflicts to the architect. The A/V contractor shall check all factors including the design, function and performance of the system and be fully cognizant of the requirements.

4. Audio video contractor shall verify all dimensions affecting this project.

5. Audio video contractor shall report immediately any discrepancies to any of the above conditions to the architect.

6. In the event of a conflict within or between the Drawings and Specifications, the Specifications shall hold precedence unless a written decision from the Design Team has been obtained for clarification or approval of an alternative method and/or materials.

7. This Prime contractor is responsible for the coordination of and arranging for any and all inspection for their scope of work as required. This includes Manufacturers inspections.

8. This Prime Contractor shall conduct weekly Safety and Tailgate meetings with signed attendance forms to be submitted to the Construction Manager on a weekly basis.

9. Continuous housekeeping and daily cleanup of litter and excess building materials is mandatory. This Prime Contractor shall obtain a trash dumpster on site at all times while his scope of work is in progress. The Prime Contractor shall put daily accrued debris in their own dumpster containers or as directed by the Construction Manager. All trash dumpsters and containers shall be disposed of in a timely manner to prevent damage in existing concrete or asphalt area. No 40-yard dumpsters or roll-offs shall be allowed to be placed in/on grass areas. All GC furnished dumpsters shall have a minimum of 1 (ea. per contact wheel or base) a 4'x8'x ¾" thick piece of plywood where the dumpster comes into contact with the ground. If the Prime Contractor fails to perform daily cleanup and disposal, the Construction Manager reserve the right to provide this cleanup at the Prime Contractors cost.

10. Provide for all White Glove Clean Up scope of work for all exterior of the constructed building and surrounding site for the entire project, including but not necessarily limited to Interior Cleaning, Mopping, Dusting, Window Cleaning, removal of all residual trash after all other Sub-contractors have completed their final clean up and power washing with hot water all sidewalks and pavement. All final White Glove Clean Up must have the Districts final approval through the Construction Manager. The white glove clean up shall be listed as a separate line item on the Contractor's Schedule of Values to a fair project value sum that is Construction Manager approved, but no less than $2,000.00.

This Prime Contractor shall conform to all the requirements of Divisions27 Specifications as follows:

11. Provide all labor, material, and equipment necessary for Demolition scope of work, per Plans and Specification section 02 41 00 as related to this Prime Contractors scope of work.

12. The Prime Contractor must include in their bid a minimum of 200 linear feet of temporary fencing consisting of 12-foot-long chain-link panels on fencing stands, with a minimum of 2 sandbags per stand, intended for securing a contractor laydown area. This temporary fencing must also incorporate the application of green visual filter fabric upon erection. The Contractor is accountable for maintaining the fencing's appearance and is obligated to secure the space using a

chain and combination lock at all points of entry. Identification and coordination of the Prime Contractor's laydown area will be undertaken by the Construction Manager during the preconstruction meeting.

The following is additional information, instructions and detailed requirements for the Prime Contractors scope of work as identified in items one (1) through eighteen (12) above. Not all specification sections are mentioned below, only further detail of this Prime Contractors scope of work.

GENERAL ITEMS

19. This Contractor shall review the drawings and understand the scope of work indicated in the plans and specifications.

20. This Prime Contractor is required to provide Daily Manpower Reports for all his and all his Subcontractor personnel to the Construction Manager each day.

21. All costs for repairs due to this Prime Contractor negligence shall be borne by this Prime Contractor without impact to the approved construction schedule and without additional cost to the district.

22. Provide all shop drawings and submittals so as not to cause any delays to any portion of the construction schedule for this Prime Contractor any other Prime Contractor included in this project.

23. Provide adequate penetrations, block outs, outlets, openings, cutouts, fixture locations, backing, and access panel openings. Coordinate as necessary with other Bid Package Prime Contractors.

24. Continuous site cleanup of the construction site is mandatory. This includes sweeping, water removal, and litter/debris removal of the interior & exterior of the building and staging areas. This Prime Contractor shall provide own debris boxes/dumpsters for the duration of the project and put debris in own debris boxes and remove said boxes from site at this Prime Contractor's own expense prior to the end of the workday or as directed by the Construction Manager. All debris boxes and containers shall be kept free of graffiti at all times. If this Prime Contractor fails to perform daily clean up, the Construction Manager upon written notice to the Prime Contractor shall order that clean up done at this Prime Contractor's expense and adjust Prime Contractors contract accordingly.

25. This Prime Contractor shall coordinate his work with that of other prime contractors, subcontractors, and work by the district. All potential space conflicts are to be identified during the bidding and field investigation process. If a field space conflict is encountered, it shall be reworked or rerouted at no additional cost, and only a scope change by the Design Team will be considered for contract price adjustment.

26. Request For Information – Should there be any obscurity or contradiction, the Prime Contractor will be responsible to submit a Request for Information in writing to the Construction Manager as they relate to issues regarding interpretation and/or clarifications of the plans and specifications. The Construction Manager will forward the information to the Design Team/District for response. All requests shall be made in a timely manner allowing for seven (7)-calendar days response time so as not to delay the work or overall schedule.

27. Revisions/Updating Contract Documents – This Prime Contractor is responsible to immediately update all field and office sets of contract documents upon receipt of any revised instructions. This includes addendum, revised drawings, "RFI" responses, Bulletins, etc. This Prime Contractor shall insert, "cut and paste", and revise with red ink or other suitable methods denoting the most current Construction Document changes. Payments to the contractor shall be withheld until the drawings are updated.

28. Record Drawings – This Prime Contractor shall maintain and update all changes in the work on the Project record drawing set in the field. All entries must be made and be prepared to be reviewed by the Project Manager daily. Payments to the contractor shall be withheld until drawings are updated to the satisfaction of current field progress made by the construction manager.

29. Prime Contractor Personnel – The district has complete authority to review and approve selection of this Prime Contractor's field and office personnel for this project. The district has authority to request replacement of any of the Contractor's personnel for reasons determined by the district. This Prime Contractor shall maintain the same approved personnel throughout the entire duration of the project at the district's discretion. This Prime Contractor will, at the time of award of work, furnish a list of persons assigned to the project showing their titles and telephone numbers. Emergency telephone numbers shall also be provided for after hour use by the district.

    This Prime Contractor agrees to provide a minimum of one competent English-speaking skilled foreman or superintendent who shall be present at all times during execution of this Prime Contractor's work.

30. Failure to provide an adequate Project Manager or Superintendent shall result in an assessment of Construction Management costs levied to have the Construction Manager coordinate and manage prime contractors / subcontractor's work. In no event shall Construction Manager be liable for any costs associated with this Prime Contractors lack of supervision. This Prime Contractor agrees to use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work.

31. Timely requests for clarifications and other information to allow reasonable response time and avoid delay to the construction schedule.

32. Provide all hoisting necessary for this Prime Contractors entire scope of work.

33. Provide all temporary access as required for the Prime Contractor's entire scope of work. This includes, but is not limited to, trench plates, scaffolding, catwalks, scissors lifts, Pettibones, rigging, cranes, gang ways, etc.

34. Schedule shall be in accordance with District approved construction milestone schedule and all subsequent revisions.

35. The Prime Contractor, upon completion of the entire bid scope, is responsible for submitting a request for a punch list walk to the Construction Manager for the Design Team to generate. This includes punch list repairs/corrections, final cleanup, and closeout for this bid package in accordance with the contract construction schedule. Both parties acknowledge that delays in the completion of

the punch list, final cleanup, and closeout would constitute a project completion delay. Consequently, the District reserves the right, as per the Contract Documents, to withhold potential liquidated damages from the Prime Contractor's progress payments.

Substantial completion will not be acknowledged or issued until the Design Team establishes and issues the punch list, and any remaining items are confirmed not to affect the beneficial occupancy of the project scope area.

B. Existing Site Conditions: This Prime Contractor shall make a thorough examination of the site to determine all existing conditions affecting the work prior to beginning any work under this bid package. All conflicts within the contract documents and existing conditions are to be brought to the attention of the Construction Manager during the bidding process by way of the pre-bid clarification form issued at the job walk. Any claims for changes in scope or claims for additional compensation will not be considered for this contractor's failure to notify the Construction Manager of such a conflict/discrepancy.

C. Location of Site:

Mission Vista High School, 1306 Melrose Drive, Oceanside Ca 92057

D. Work Not Included: Items specifically listed in other 01010 scopes of work sections.

1.03 CONTRACT METHOD:

A. Construct the Work under a single Lump Sum Contract with a Schedule of Values.

1.04 CONTRACTOR USE OF PREMISES:

A. Contractor shall have use of the premises for the execution of the work as outlined in the staging / phasing plan in the drawings.

B. Work Week and Job Hours – Activities at the Project Site shall be conducted between the hours of 7:00 am and 5:00 pm, Monday through Friday, unless otherwise authorized by the district.

C. Coordinate use of the premises under the direction of the Construction Manager.

D. Contractor parking and access between parking and the jobsite must separate from the student population. Barricades are required for the contractor access route to ensure that the project workforce is kept separate from the student population. Interaction with students is prohibited.

E. Assume full responsibility for the protection and safekeeping of products & Work under this Prime Contract that are stored & installed on the site.

F. This Prime Contractor shall enforce that all persons working on the site use only non-permanent markers, tapes and tags to indicate construction techniques and instructions, on construction in progress, and on existing construction. This includes markings on exterior and interior of building and on walks, curbs, walls and other site surfaces. Where work is damaged or defaced by use of permanent marking devices, such work will be subject to cleaning, repair or replacement, as the Design Team may require.

G. Move any stored products under This Prime Contractor's control that interferes with the operations of the Owner and/or any other Contractor that is on a separate contract.

H. Theft: If any person working on the contract should engage in theft of money, property, supplies, equipment, food, or any other item, whether from the district's personnel, students, facilities, employees, visitors, or from another of the Contractor's personnel or subcontractors, will be immediately and permanently dismissed from the site.

I. All District property is drug free, alcohol free, weapons free and graffiti free. This Prime Contractor shall enforce these rules to his crew, subcontractors and suppliers.

J. All contractors shall be required to provide work attire that always display the company logo from their firm indicating employee association to the workforce ongoing while on District property. The Superintendent or Foreman shall be responsible for signing in all personnel under his/her authority every day and providing the sign-in sheet to the Construction Manager at the close of every business day. This cost shall be included in the Contractor's bid.

END OF SECTION 01010

SECTION 01100 - 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. Owner-furnished products.
   3. Use of premises.
   4. Owner's occupancy requirements.
   5. Work restrictions.
   6. Specification formats and conventions.

B. Related Sections include the following:
   1. Division 1 Section "Summary of Multiple Contracts" for division of responsibilities for the Work.
   2. Division 1 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: The scope of this project includes all work pertaining to Audio/ Video upgrades at the Theater of MVHS, with Audio/Video and Lighting/ Drapery. Audio/Visual scope consisting of existing programming being updated for the new equipment, replacing old components for the house speaker system, replacement of the audio floor boxes. Installation of Owner Furnished Contractor Installed (OFCI) of Audio/Video equipment; 64 Channel Audio mixer , (12) Wireless Microphone Systems, 10U countertop rack , update on Theater network system (replacing broken ports in the floor boxes, replacing failing switch), (2) RF Venue diversity architectural antenna, table for audio mixer, adding video monitoring for backstage and control room (4 monitors), add video monitors in the lobby/foyer area (2 monitors), replace the coax CCTV system, Install a cable “passthrough” between the control and the new audio mixer, mount the existing projector, adding 4-5 electrical plugs.

B.

   1. Project Location:
      Mission Vista High School
      1306 Melrose Drive
      Oceanside, California 92057

   2. Owner: Vista Unified School District. 1234 Arcadia Avenue Vista, CA 92084

C. Construction Manager: Gafcon, Inc., has been engaged as Construction Manager for this Project to serve as an advisor to Owner and to provide assistance in administering the Contract for Construction between Owner and each Contractor, according to a separate contract between Owner and Construction Manager/Contractor.

1.4 WORK UNDER OTHER CONTRACTS

A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.

1.5 OWNER-FURNISHED PRODUCTS

A. Owner will furnish products indicated. The Work includes providing support systems to receive Owner's equipment and Audio/Visual connections.
   1. Owner will arrange for and deliver Shop Drawings, Product Data, and Samples to Contractor.
   2. Owner will arrange and pay for delivery of Owner-furnished items according to Contractor's Construction Schedule.
   3. After delivery, Owner will inspect delivered items for damage. Contractor shall be present for and assist in Owner's inspection.
   4. If Owner-furnished items are damaged, defective, or missing, Owner will arrange for replacement.
   5. Owner will arrange for manufacturer's field services and for delivery of manufacturer's warranties to Contractor.
   6. Owner will furnish Contractor the earliest possible delivery date for Owner-furnished products. Using Owner-furnished earliest possible delivery dates, Contractor shall designate delivery dates of Owner-furnished items in Contractor's Construction Schedule.
   7. Contractor shall review Shop Drawings, Product Data, and Samples and return them to Program Manager noting discrepancies or anticipated problems in use of product.
   8. Contractor is responsible for receiving, unloading, and handling Owner-furnished items at Project site.
   9. Contractor is responsible for protecting Owner-furnished items from damage during storage and handling, including damage from exposure to the elements.
   10. If Owner-furnished items are damaged as a result of Contractor's operations, Contractor shall repair or replace them.
   11. Contractor shall install and otherwise incorporate Owner-furnished items into the Work.

B. Owner-Furnished Products:
   1. Audio/Video contractor shall coordinate with the owner to take ownership of the owner furnished; Contractor-Installed equipment (OFCI) The audio/video shall be responsible for the OFCI items once they are received

1.6 USE OF PREMISES

A. General: Contractor shall have full use of premises for Vista Unified School District construction operations during construction period. Contractor's use of premises is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

B. The other buildings on campus will be in use and occupied during the construction period.

1.7 OWNER'S OCCUPANCY REQUIREMENTS

A. Owner Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed areas of buildings, before

Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.

1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied before Owner occupancy.
2. Obtain a Certificate of Occupancy from authorities having jurisdiction before Owner occupancy.
3. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of building.
4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of building.

1.8 WORK RESTRICTIONS

A. On-Site Work Hours: See Section 00400 Article 23.
   1. Early Morning Hours: Activities that do not generate noise perceptible beyond the limits of work are not restricted.
   2. Hours for Utility Shutdowns must be coordinated to not interfere with Owner's operations.

1.9 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC's "Master Format" 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.

1.10 MISCELLANEOUS PROVISIONS

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011

SECTION 01230 - ALTERNATES

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 alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, submittals, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

2. See drawings for additional information.

B. Execute accepted alternates under the same conditions as other work of the Contract.

C. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

END OF SECTION 01230

SECTION 01250 - 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 "Allowances" for procedural requirements for handling and processing allowances.
   2. Division 1 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

1.3 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Construction Manager will 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 by Construction Manager 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.

B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to the Construction Manager and Architect.
   1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
   2. 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.
   3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
   4. Include costs of labor and supervision directly attributable to the change.
   5. 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.
   6. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

C. Proposal Request Form: Use AIA Document G709 for Proposal Requests or other form as required by the District.

1.4 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Construction Manager will issue a Change Order for signatures of Owner and Architect on AIA Document G701 or other form as required by the District.

1.5 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714 or other form as required by the District. 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 (Not Used)

END OF SECTION 01250

SECTION 01270 - UNIT PRICES

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 unit prices.

B. Related Sections include the following:
   1. Division 1 Section "Allowances" for procedures for using unit prices to adjust quantity allowances.
   2. Division 1 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
   3. Division 1 Section "Quality Requirements" for general testing and inspecting requirements.

1.3 DEFINITIONS

A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

D. List of Unit Prices: A list of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

A. Demolition of concrete that is thicker than noted on the drawings

B. Demolition of linear footage of concrete curb under existing walls.

END OF SECTION 01270

SECTION 01290 - 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 "Allowances" for procedural requirements governing handling and processing of allowances.
   2. Division 1 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
   3. Division 1 Section "Unit Prices" for administrative requirements governing use of unit prices.
   4. Division 1 Section "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 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 the District per the General Conditions.
   3. Subschedules: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.

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. 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.
3. 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. Include separate line items under required principal subcontracts for operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training in the amount of 5 percent of the Contract Sum.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. 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.
6. 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.
7. 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.
8. 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.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with requirements of the General Conditions, previous applications and payments as certified by Architect and Construction Manager 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: The date for each progress payment is indicated in the General Conditions. 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 or other form as required by the District.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Construction Manager 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 Construction Manager 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. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
   1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
   2. Submit final Application for Payment with or proceeded by final waivers from every entity involved with performance of the Work covered by the application that is lawfully entitled to a lien.
   3. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

G. 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 authorizations and licenses from authorities having jurisdiction for performance of the Work.
   10. Initial progress report.
   11. Report of preconstruction conference.
   12. Certificates of insurance and insurance policies.
   13. Comply with any other requirements that the College District deems necessary.

H. 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.

I. 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 01290

SECTION 01310 - 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. Coordination Drawings.
   2. Administrative and supervisory personnel.
   3. Project meetings.

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.

C. Related Sections include the following:
   1. Division 1 Section "Construction Progress Documentation" for preparing and submitting Contractor's Construction Schedule.
   2. Division 1 Section "Closeout Procedures" for coordinating Contract closeout.

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, which 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.
   5. The specified acoustical assemblies require careful fitting of building components to the specified tolerances. Coordination between trades is required at work interfaces such as penetrations of ducting, piping and conduits to achieve airtight construction. Acoustical performance will be degraded if airtight construction is not achieved. All acoustical materials and accessories shall be installed in conformance with the manufacturer’s instructions.

B. If necessary 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 the Construction Manager 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. Pre-installation 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. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
   1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:
      a. Indicate relationships of components on separate Shop drawings.
      b. Indicate required installation sequences.
   2. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.

B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
   1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

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.

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 Construction Manager, Inspector of Record, Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner, Construction Manager, 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, Construction Manager, Inspector of Record, 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.
    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 requests for interpretations (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.

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 Inspector of Record and Construction Manager 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 requests for interpretations (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 least biweekly, or more frequently as required by the stage of construction intervals. Coordinate dates of meetings with preparation of payment requests.
1. Attendees: In addition to representatives of Owner**,** Construction Manager, 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) Requests for interpretations (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 and distribute to Contractor the meeting minutes.
4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
    a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

E. Coordination Meetings: Conduct Project coordination meetings at regular intervals as required by the stage of construction. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
    1. Attendees: In addition to representatives of Owner, Construction Manager, and Inspector of Record, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work
    2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
        a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to Combined Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
        b. Schedule Updating: Revise Combined Contractor's Construction Schedule after each coordination meeting where revisions to the schedule have been

made or recognized. Issue revised schedule concurrently with report of each meeting.

c. Review present and future needs of each contractor present, including the following:
    1) Interface requirements.
    2) Sequence of operations.
    3) Status of submittals.
    4) Deliveries.
    5) Off-site fabrication.
    6) Access.
    7) Site utilization.
    8) Temporary facilities and controls.
    9) Work hours.
    10) Hazards and risks.
    11) Progress cleaning.
    12) Quality and work standards.
    13) Change Orders.

3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01310

SECTION 01320 - 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. Preliminary Construction Schedule.
   2. Contractor's Construction Schedule.
   3. Submittals Schedule.
   4. Daily construction reports.
   5. Field condition reports.
   6. Special 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 "Photographic Documentation" for submitting construction photographs.
   5. Division 1 Section "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
   1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
   2. Predecessor Activity: An activity that precedes another activity in the network.
   3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the Schedule of Values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by Architect.

C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity.
   1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
   2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
   3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

H. Major Area: A story of construction, a separate building, or a similar significant construction element.

I. Milestone: A key or critical point in time for reference or measurement.

J. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

K. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 SUBMITTALS

A. Qualification Data: For firms and persons specified in ”Quality Assurance” Article to demonstrate their capabilities and experience. Include lists of complete projects with project names and addresses, names and addresses of architects and owners, anad other information specified.

B. 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 and Construction Manager's final release or approval.

C. Contractor's Master Baseline Construction Schedule: Submit two opaque copies of initial schedule, large enough to show entire schedule for entire construction period.

D. CPM Reports: Concurrent with CPM schedule, submit three copies of each of the following computer-generated reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining

duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.

1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
3. Total Float Report: List of all activities sorted in ascending order of total float.
4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.

E. Daily Construction Reports: Submit two copies at weekly intervals.

F. Field Condition Reports: Submit two copies at time of discovery of differing conditions.

G. Special Reports: Submit two copies at time of unusual event.

1.5 QUALITY ASSURANCE

A. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to the Contractor's Master Baseline Construction Schedule, including, but not limited to, the following:

1. Review software limitations and content and format for reports.
2. Verify availability of qualified personnel needed to develop and update schedule.
3. Discuss constraints, including work stages, interim milestones, and partial Owner occupancy.
4. Review delivery dates for Owner-furnished products.
5. Review schedule for work of Owner's separate contracts.
6. Review time required for review of submittals and resubmittals.
7. Review requirements for tests and inspections by independent testing and inspecting agencies.
8. Review time required for completion and startup procedures.
9. Review and finalize list of construction activities to be included in schedule.
10. Review submittal requirements and procedures.
11. Review procedures for updating schedule.

1.6 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
   1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Master Baseline Construction Schedule.
   2. Initial Submittal: Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.

   3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

   4. Monthly Submittal Update: Provide summary of submittal status at each Pay Request Meeting.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."

B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.
   1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:

   1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
   2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
   3. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
   4. Startup and Testing Time: Include not less than 5 days for startup and testing.
   5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's and Construction Manager's administrative procedures necessary for certification of Substantial Completion.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
   1. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.

2. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Division 1 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
3. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Division 1 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
4. Work Restrictions: Show the effect of the following items on the schedule:
    a. Uninterruptible services.
    b. Partial occupancy before Substantial Completion.
    c. Use of premises restrictions.
    d. Provisions for future construction.
    e. Seasonal variations.
    f. Environmental control.
5. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
    a. Subcontract awards.
    b. Submittals.
    c. Purchases.
    d. Mockups.
    e. Fabrication.
    f. Sample testing.
    g. Deliveries.
    h. Installation.
    i. Tests and inspections.
    j. Adjusting.
    k. Curing.
    l. Startup and placement into final use and operation.
6. Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
    a. Structural completion.
    b. Permanent space enclosure.
    c. Completion of mechanical installation.
    d. Completion of electrical installation.
    e. Substantial Completion.

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

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

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

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

A. General: Prepare network diagrams using AON (activity-on-node) format.

B. Preliminary Network Diagram: Submit diagram within 14 days of date established for the Notice to Proceed. Outline significant construction activities for the first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

C. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
   1. Identification of activities that have changed.
   2. Changes in early and late start dates.
   3. Changes in early and late finish dates.
   4. Changes in activity durations in workdays.
   5. Changes in the critical path.
   6. Changes in total float or slack time.
   7. Changes in the Contract Time.

D. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.
   1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
   2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
   3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
   4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
      a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
      b. Submit value summary printouts one week before each regularly scheduled progress meeting.

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. High and low temperatures and general weather conditions.
   5. Accidents.
   6. Meetings and significant decisions.
   7. Unusual events (refer to special reports).
   8. Stoppages, delays, shortages, and losses.
   9. Meter readings and similar recordings.
   10. Emergency procedures.
   11. Orders and requests of authorities having jurisdiction.
   12. Change Orders received and implemented.
   13. Construction Change Directives received and implemented.
   14. Services connected and disconnected.
   15. Equipment or system tests and startups.
   16. Partial Completions and occupancies.
   17. Substantial Completions authorized.

B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation on CSI Form 13.2A. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.5 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.
   1. In-House Option: Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
   2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.

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

C. Distribution: Distribute copies of approved schedule to Architect, Construction Manager, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
   1. Post copies in Project meeting rooms and temporary field offices.
   2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01320

SECTION 01330 - 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 submitting Shop Drawings, Product Data, Samples, and other submittals.

B. 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 and for mockup requirements.
   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. Division 1 Section "Demonstration and Training" for submitting videotapes of demonstration of equipment and training of Owner's personnel.
   9. Divisions 2 through 16 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. General: Electronic copies of CAD Drawings of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.

B. Acoustical and noise control products indicate minimum level of quality and performance.
   1. Where particular acoustic ratings are scheduled or requested, submit detailed performance specifications and independent acoustical laboratory test reports.

2. Any proposed substitutions shall be clearly identified and accompanied by manufacturer's standard catalog information.
    a. Include detailed performance specifications and independent laboratory test reports.
3. Substitutions will not be considered without proper documentation of performance.

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. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 15 days for review of each resubmittal.
4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Construction Manager, through Architect, before being returned to Contractor.
6. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.

F. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect and Construction Manager.
3. Include the following information on label for processing and recording action taken:
    a. Project name.
    b. Date.
    c. Name and address of Architect and Construction Manager.
    d. Name and address of Contractor.

e. Name and address of subcontractor.
f. Name and address of supplier.
g. Name of manufacturer.
h. Submittal number or other unique identifier, including revision identifier.
1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06100.01.A).
i. Number and title of appropriate Specification Section.
j. Drawing number and detail references, as appropriate.
k. Other necessary identification.

G. Deviations: Highlight, encircle and describe, or otherwise specifically identify deviations from the Contract Documents on submittals.

H. Additional Copies: Unless additional copies are required for final submittal, and unless Architect or Construction Manager observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect and Construction Manager.
2. Additional copies submitted for maintenance manuals will not be marked with action taken and will be returned.

I. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect and Construction Manager will return submittals, without review, received from sources other than Contractor.
1. Transmittal Form: Use AIA Document G810**.**
2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect and Construction Manager on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.

J. 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.

K. 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.

L. Use for Construction: Use only final submittals with mark indicating action taken by Architect in connection with construction.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
   1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
   2. Mark each copy of each submittal to show which products and options are applicable.
   3. Include the following information, as applicable:
      a. Manufacturer's written recommendations.
      b. Manufacturer's product specifications.
      c. Manufacturer's installation instructions and certifications. Identify conflicts between manufacturer’s instruction and contract documents.
      d. Standard color charts.
      e. Manufacturer's catalog cuts.
      f. Wiring diagrams showing factory-installed wiring.
      g. Printed performance curves.
      h. Operational range diagrams.
      i. Mill reports.
      j. Standard product operation and maintenance manuals.
      k. Compliance with specified referenced standards.
      l. Compliance with recognized testing agency’s standards.
      m. Application of testing agency labels and seals.
      n. Notation of coordination requirements.
   4. Submit Product Data before or concurrent with Samples.
   5. Number of Copies: Submit two copies of Product Data, unless otherwise indicated. Architect, will return three copies. Mark up and retain one returned copy as a Project Record Document.
   6. The acoustical and noise control products specified herein are intended to indicate a minimum level of quality and performance. Whether particular acoustical ratings are scheduled or requested, submit detailed performance specifications, and independent acoustical laboratory test reports. Any proposed substitutions shall be clearly identified as such and accompanied by manufacturer’s standard catalog information including detailed performance specifications and independent acoustical laboratory test reports. Substitutions will not be considered without proper documentation of performance.

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 and drawing scales.
      b. Identification of products.
      c. Fabrication and installation drawings.
      d. Roughing-in and setting diagrams.
      e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
      f. Shopwork manufacturing instructions.
      g. Templates and patterns.
      h. Schedules.
      i. Design calculations: Where stipulated in the specifications, calculations to be sealed and signed by an engineer currently licensed in California for the specific discipline involved.
      j. Compliance with specified standards.
      k. Notation of coordination requirements.

l. Notation of dimensions established by field measurement.

2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
3. 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.
4. Number of Copies: Submit copies of each submittal, as follows:
    a. Initial Submittal: Submit one correctable, translucent, reproducible print and three blue- or black-line prints. One copy to be Construction Manager and the reproducible and two copies to the Architect. Architect will return the reproducible print(s). Reproducible copy is to be retained on site as a project record document. Additional copies are to be reproduced as required for all parties involved at Contractor's expense.
    b. Close-out Submittal: Submit seven prints where prints are required for operation and maintenance manuals.

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 one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
    a. Number of Samples: Submit three 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 trade name and model number, for each product.
2. Number and name of room or space.
3. Location within room or space.
4. Number of Copies: Submit three copies of product schedule or list, unless otherwise indicated. Architect, will return two copies.
a. Mark up and retain one returned copy as a Project Record Document.

F. Submittals Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."

2.2 INFORMATIONAL SUBMITTALS

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

B. Coordination Drawings: Comply with requirements specified in Division 1 Section "Project Management and Coordination."

C. Contractor's Construction Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."

D. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

H. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

I. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

J. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

K. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

L. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
   1. Name of evaluation organization.
   2. Date of evaluation.
   3. Time period when report is in effect.
   4. Product and manufacturers' names.
   5. Description of product.
   6. Test procedures and results.
   7. Limitations of use.

M. 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. Comply with requirements specified in Division 1 Section "Operation and Maintenance Data."

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.
   7. Identify conflicts between manufacturer’s instructions and Contract Documents.

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.

2.3 DELEGATED DESIGN

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
   1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit three copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
   1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S AND CONSTRUCTION MANAGER’S REVIEW

A. Contractor is to 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 and Construction Manager.

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 and Construction Manager'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, as follows:
   1. "No Exceptions Taken" Products may be used in the project.
   2. "Furnish as Corrected" Products may be used in the project with inclusion of noted corrections have been made.
   3. "Submit as Samples" Submit samples for review of the products.
   4. "Revise & Resubmit." Revise submittal to comply with construction documents and resubmit for review.
   5. "Rejected" Products do not comply with construction documents and may not be used.
   6. "Resubmit only items noted: Resubmit items as noted, remaining products may be used in the project.

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 non-responsive, and will be returned without review.

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

END OF SECTION 01330

SECTION 01400 - 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.
4. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

1.3 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.

1.4 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. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction,

coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.

D. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

E. 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.

F. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.5 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.

1.6 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.

1.7 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. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be

designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

C. 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.

D. 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.

E. 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.

1.8 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 professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

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 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.

I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
   1. Contractor responsibilities include the following:
      a. Provide test specimens representative of proposed products and construction.
      b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
      c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
      d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
      e. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.
   2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Inspector of Record, Construction Manager and Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
   1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
   2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
   3. Demonstrate the proposed range of aesthetic effects and workmanship.
   4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
      a. Allow seven days for initial review and each re-review of each mockup.
   5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
   6. Demolish and remove mockups when directed, unless otherwise indicated.

1.9 QUALITY CONTROL

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

B. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
   1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
      a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
   2. Notify testing agencies at least 48 hours in advance of time when Work that requires testing or inspecting will be performed.
   3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
   4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
   5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section "Submittal Procedures."

D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and

reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

E. Testing Agency Responsibilities: Cooperate with Architect, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
   1. Notify Architect, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
   2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
   3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
   4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
   5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
   6. Do not perform any duties of Contractor.

F. 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. Preliminary design mix proposed for use for material mixes that require control by testing agency.
   6. Security and protection for samples and for testing and inspecting equipment at Project site.

G. 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.

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

1.10 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:
   1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.

2. Notifying Inspector of Record, Construction Manager, Architect, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Inspector of Record, Construction Manager, and Architect, with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, that includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and re-inspecting corrected work.

PART 2 – NOT USED

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Prepare a record of tests and inspections. Include the following:
   1. Date test or inspection was conducted.
   2. Description of the Work tested or inspected.
   3. Date test or inspection results were transmitted to Architect.
   4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
   1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
   2. Comply with the Contract Document requirements for Division 1 Section "Cutting and Patching."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01400

SECTION 01420 - 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 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.

C. Conflicting Requirements: Where compliance with two or more standards is specified and the standards establish different or conflicting 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.

1. 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 the requirements. Refer uncertainties to Architect for a decision before proceeding

D. 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.

E. 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 in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities Available from Access Board www.access-board.gov	(800) 872-2253 (202) 272-0080
CFR	Code of Federal Regulations Available from Government Printing Office www.access.gpo.gov/nara/cfr	(888) 293-6498 (202) 512-1530
CRD	Handbook for Concrete and Cement Available from Army Corps of Engineers Waterways Experiment Station www.wes.army.mil	(601) 634-2355
DOD	Department of Defense Military Specifications and Standards Available from Department of Defense Single Stock Point www.dodssp.daps.mil	(215) 697-6257
DSCC	Defense Supply Center Columbus (See FS)	
FED-STD	Federal Standard (See FS)	
FS	Federal Specification Available from Department of Defense Single Stock Point www.dodssp.daps.mil	(215) 697-6257

	Available from General Services Administration www.apps.fss.gsa.gov/pub/fedspecs/index.cfm	(202) 619-8925
	Available from National Institute of Building Sciences www.nibs.org	(202) 289-7800
FTMS	Federal Test Method Standard (See FS)	
MIL	See MILSPEC	
MS MIL	See MILSPEC	
MILSPEC	Military Specification and Standards Available from Department of Defense Single Stock Point www.dodssp.daps.mil	(215) 697-6257
UFAS	Uniform Federal Accessibility Standards Available from Access Board www.access-board.gov	(800) 872-2253 (202) 272-5434

1.4 ABBREVIATIONS AND ACRONYMS

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

AA	Aluminum Association, Inc. (The) www.aluminum.org	(202) 862-5100
AAADM	American Association of Automatic Door Manufacturers www.aaadm.com	(216) 241-7333
AABC	Associated Air Balance Council www.aabchq.com	(202) 737-0202
AAMA	American Architectural Manufacturers Association www.aamanet.org	(847) 303-5664
AASHTO	American Association of State Highway and Transportation Officials www.aashto.org	(202) 624-5800
AATCC	American Association of Textile Chemists and Colorists (The) www.aatcc.org	(919) 549-8141
ABMA	American Bearing Manufacturers Association www.abma-dc.org	(202) 367-1155

ACI	American Concrete Institute/ACI International www.aci-int.org	(248) 848-3700
ACPA	American Concrete Pipe Association www.concrete-pipe.org	(972) 506-7216
AEIC	Association of Edison Illuminating Companies, Inc. (The) www.aeic.org	(205) 257-2530
AFPA	American Forest & Paper Association (See AF&PA)	
AF&PA	American Forest & Paper Association www.afandpa.org	(800) 878-8878 (202) 463-2700
AGA	American Gas Association www.aga.org	(202) 824-7000
AGC	Associated General Contractors of America (The) www.agc.org	(703) 548-3118

AHA	American Hardboard Association www.hardboard.org	(847) 934-8800
AHAM	Association of Home Appliance Manufacturers www.aham.org	(202) 872-5955
AI	Asphalt Institute www.asphaltinstitute.org	(859) 288-4960
AIA	American Institute of Architects (The) www.aia.org	(800) 242-3837 (202) 626-7300
AISC	American Institute of Steel Construction www.aisc.org	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute www.steel.org	(202) 452-7100
AITC	American Institute of Timber Construction www.aitc-glulam.org	(303) 792-9559
ALCA	Associated Landscape Contractors of America www.alca.org	(800) 395-2522 (703) 736-9666
ALSC	American Lumber Standard Committee, Incorporated www.alsc.org	(301) 972-1700
AMCA	Air Movement and Control Association International, Inc. www.amca.org	(847) 394-0150
ANSI	American National Standards Institute www.ansi.org	(202) 293-8020
AOSA	Association of Official Seed Analysts www.aosaseed.com	(505) 522-1437
APA	APA - The Engineered Wood Association www.apawood.org	(253) 565-6600
APA	Architectural Precast Association www.archprecast.org	(239) 454-6989
API	American Petroleum Institute www.api.org	(202) 682-8000
ARI	Air-Conditioning & Refrigeration Institute www.ari.org	(703) 524-8800
ARMA	Asphalt Roofing Manufacturers Association www.asphaltroofing.org	(202) 207-0917

ASCA	Architectural Spray Coaters Association www.ascassoc.com	(856) 848-6120
ASCE	American Society of Civil Engineers www.asce.org	(800) 548-2723 (703) 295-6300
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers www.ashrae.org	(800) 527-4723 (404) 636-8400
ASME	ASME International (The American Society of Mechanical Engineers International) www.asme.org	(800) 843-2763 (212) 591-7722
ASSE	American Society of Sanitary Engineering www.asse-plumbing.org	(440) 835-3040
ASTM	ASTM International	(610) 832-9585

	(American Society for Testing and Materials International) www.astm.org	
AWCI	AWCI International (Association of the Wall and Ceiling Industries International) www.awci.org	(703) 534-8300
AWCMA	American Window Covering Manufacturers Association (See WCSC)	
AWI	Architectural Woodwork Institute www.awinet.org	(800) 449-8811 (703) 733-0600
AWPA	American Wood-Preservers' Association www.awpa.com	(817) 326-6300
AWS	American Welding Society www.aws.org	(800) 443-9353 (305) 443-9353
AWWA	American Water Works Association www.awwa.org	(800) 926-7337 (303) 794-7711
BHMA	Builders Hardware Manufacturers Association www.buildershardware.com	(212) 297-2122
BIA	Brick Industry Association (The) www.bia.org	(703) 620-0010
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International) www.bifma.com	(616) 285-3963
CCC	Carpet Cushion Council www.carpetcushion.org	(203) 637-1312

CCFSS	Center for Cold-Formed Steel Structures www.umr.edu/~ccfss	(573) 341-4471
CDA	Copper Development Association Inc. www.copper.org	(800) 232-3282 (212) 251-7200
CEA	Canadian Electricity Association www.canelect.ca	(514) 866-6121
CFFA	Chemical Fabrics & Film Association, Inc. www.chemicalfabricsandfilm.com	(216) 241-7333
CGA	Compressed Gas Association www.cganet.com	(703) 788-2700
CGSB	Canadian General Standards Board www.pwgsc.gc.ca/cgsb	(819) 956-0425
CIMA	Cellulose Insulation Manufacturers Association www.cellulose.org	(888) 881-2462 (937) 222-2462
CISCA	Ceilings & Interior Systems Construction Association www.cisca.org	(630) 584-1919
CISPI	Cast Iron Soil Pipe Institute www.cispi.org	(423) 892-0137
CLFMI	Chain Link Fence Manufacturers Institute www.chainlinkinfo.org	(301) 596-2583
CPPA	Corrugated Polyethylene Pipe Association www.cppa-info.org	(800) 510-2772 (202) 462-9607

CRI	Carpet & Rug Institute (The) www.carpet-rug.com	(800) 882-8846 (706) 278-3176
CRSI	Concrete Reinforcing Steel Institute www.crsi.org	(847) 517-1200
CSA	CSA International (Formerly: IAS - International Approval Services) www.csa-international.org	(800) 463-6727 (416) 747-4000
CSI	Construction Specifications Institute (The) www.csinet.org	(800) 689-2900 (703) 684-0300
CSSB	Cedar Shake & Shingle Bureau www.cedarbureau.org	(604) 820-7700
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute) www.cti.org	(281) 583-4087
DHI	Door and Hardware Institute www.dhi.org	(703) 222-2010
EIA	Electronic Industries Alliance www.eia.org	(703) 907-7500
EIMA	EIFS Industry Members Association www.eima.com	(800) 294-3462 (770) 968-7945
EJCDC	Engineers Joint Contract Documents Committee www.asce.org	(800) 548-2723 (703) 295-6300

EJMA	Expansion Joint Manufacturers Association, Inc. www.ejma.org	(914) 332-0040
ESD	ESD Association	(315) 339-6937
FCI	Fluid Controls Institute www.fluidcontrolsinstitute.org	(216) 241-7333
FGMA	Flat Glass Marketing Association (See GANA)	
FM	Factory Mutual System (See FMG)	
FMG	FM Global (Formerly: FM - Factory Mutual System) www.fmglobal.com	(401) 275-3000
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc. www.floridaroof.com	(407) 671-3772
FSA	Fluid Sealing Association www.fluidsealing.com	(610) 971-4850
FSC	Forest Stewardship Council www.fscoax.org	52 951 5146905
GA	Gypsum Association www.gypsum.org	(202) 289-5440
GANA	Glass Association of North America (Formerly: FGMA - Flat Glass Marketing Association) www.glasswebsite.com	(785) 271-0208
GRI	Geosynthetic Research Institute www.drexel.edu/gri	(215) 895-2343

GTA	Glass Tempering Division of Glass Association of North America (See GANA)	
HI	Hydraulic Institute www.pumps.org	(888) 786-7744 (973) 267-9700
HI	Hydronics Institute www.gamanet.org	(908) 464-8200
HMMA	Hollow Metal Manufacturers Association (See NAAMM)	
HPVA	Hardwood Plywood & Veneer Association www.hpva.org	(703) 435-2900
HPW	H. P. White Laboratory, Inc. www.hpwhite.com	(410) 838-6550
IAS	International Approval Services (See CSA)	
ICEA	Insulated Cable Engineers Association, Inc. www.icea.net	(770) 830-0369
ICRI	International Concrete Repair Institute, Inc. www.icri.org	(847) 827-0830
IEC	International Electrotechnical Commission www.iec.ch	41 22 919 02 11
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The) www.ieee.org	(212) 419-7900
IESNA	Illuminating Engineering Society of North America www.iesna.org	(212) 248-5000

IGCC	Insulating Glass Certification Council www.igcc.org	(315) 646-2234
IGMA	Insulating Glass Manufacturers Alliance (The) www.igmaonline.org	(613) 233-1510
ILI	Indiana Limestone Institute of America, Inc. www.iliai.com	(812) 275-4426
ISSFA	International Solid Surface Fabricators Association www.issfa.net	(702) 567-8150
ITS	Intertek Testing Services www.itsglobal.com	(800) 345-3851 (607) 753-6711
IWS	Insect Screening Weavers Association (Now defunct)	
KCMA	Kitchen Cabinet Manufacturers Association www.kcma.org	(703) 264-1690
LMA	Laminating Materials Association www.lma.org	(201) 664-2700
LPI	Lightning Protection Institute www.lightning.org	(800) 488-6864 (847) 577-7200
LSGA	Laminated Safety Glass Association (See GANA)	
MBMA	Metal Building Manufacturers Association www.mbma.com	(216) 241-7333
MFMA	Maple Flooring Manufacturers Association www.maplefloor.org	(847) 480-9138

MFMA	Metal Framing Manufacturers Association www.metalframingmfg.org	(312) 644-6610
MH	Material Handling Industry of America (See MHIA)	
MHIA	Material Handling Industry of America www.mhia.org	(800) 345-1815 (704) 676-1190
MIA	Marble Institute of America www.marble-institute.com	(440) 250-9222
MPI	Master Painters Institute www.paintinfo.com	(888) 674-8937
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc. www.mss-hq.com	(703) 281-6613
NAAMM	National Association of Architectural Metal Manufacturers www.naamm.org	(312) 332-0405
NAAMM	North American Association of Mirror Manufacturers (See GANA)	
NACE	NACE International (National Association of Corrosion Engineers International) www.nace.org	(281) 228-6200
NADCA	National Air Duct Cleaners Association www.nadca.com	(202) 737-2926
NAIMA	North American Insulation Manufacturers Association (The) www.naima.org	(703) 684-0084
NAMI	National Accreditation and Management Institute, Inc.	(304) 258-5100

NBGQA	National Building Granite Quarries Association, Inc. www.nbgqa.com	(800) 557-2848
NCMA	National Concrete Masonry Association www.ncma.org	(703) 713-1900
NCPI	National Clay Pipe Institute www.ncpi.org	(262) 248-9094
NCTA	National Cable & Telecommunications Association www.ncta.com	(202) 775-3550
NEBB	National Environmental Balancing Bureau www.nebb.org	(301) 977-3698
NECA	National Electrical Contractors Association www.necanet.org	(301) 657-3110
NeLMA	Northeastern Lumber Manufacturers' Association www.nelma.org	(207) 829-6901
NEMA	National Electrical Manufacturers Association www.nema.org	(703) 841-3200
NETA	InterNational Electrical Testing Association www.netaworld.org	(303) 697-8441
NFPA	NFPA International (National Fire Protection Association International) www.nfpa.org	(800) 344-3555 (617) 770-3000
NFRC	National Fenestration Rating Council www.nfrc.org	(301) 589-1776
NGA	National Glass Association www.glass.org	(703) 442-4890
NHLA	National Hardwood Lumber Association www.natlhardwood.org	(800) 933-0318 (901) 377-1818
NLGA	National Lumber Grades Authority www.nlga.org	(604) 524-2393
NOFMA	National Oak Flooring Manufacturers Association www.nofma.org	(901) 526-5016
NRCA	National Roofing Contractors Association www.nrca.net	(800) 323-9545 (847) 299-9070
NRMCA	National Ready Mixed Concrete Association	(888) 846-7622

	www.nrmca.org	(301) 587-1400
NSF	NSF International (National Sanitation Foundation International) www.nsf.org	(800) 673-6275 (734) 769-8010
NSSGA	National Stone, Sand & Gravel Association www.nssga.org	(800) 342-1415 (703) 525-8788
NTMA	National Terrazzo and Mosaic Association, Inc. www.ntma.com	(800) 323-9736 (703) 779-1022
NTRMA	National Tile Roofing Manufacturers Association (See RTI)	
NWWDA	National Wood Window and Door Association (See WDMA)	
OPL	Omega Point Laboratories, Inc. www.opl.com	(800) 966-5253 (210) 635-8100
PCI	Precast/Prestressed Concrete Institute www.pci.org	(312) 786-0300
PDCA	Painting and Decorating Contractors of America www.pdca.com	(800) 332-7322 (703) 359-0826
PDI	Plumbing & Drainage Institute www.pdionline.org	(800) 589-8956 (508) 230-3516
PGI	PVC Geomembrane Institute www.pgi-tp.ce.uiuc.edu	(217) 333-3929
RCSC	Research Council on Structural Connections www.boltcouncil.org	(800) 644-2400 (312) 670-2400
RFCI	Resilient Floor Covering Institute www.rfci.com	Contact by mail only
RIS	Redwood Inspection Service www.calredwood.org	(888) 225-7339 (415) 382-0662
RTI	Roof Tile Institute (Formerly: NTRMA - National Tile Roofing Manufacturers Association) www.ntrma.org	(541) 689-0366
SAE	SAE International www.sae.org	(724) 776-4841

SDI	Steel Deck Institute www.sdi.org	(847) 462-1930
SDI	Steel Door Institute www.steeldoor.org	(440) 899-0010
SEFA	Scientific Equipment and Furniture Association www.sefalabfurn.com	(516) 294-5424
SGCC	Safety Glazing Certification Council www.sgcc.org	(315) 646-2234
SIA	Security Industry Association www.siaonline.org	(703) 683-2075
SIGMA	Sealed Insulating Glass Manufacturers Association (See IGMA)	
SJI	Steel Joist Institute www.steeljoist.org	(843) 626-1995
SMA	Screen Manufacturers Association	(561) 533-0991
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association www.smacna.org	(703) 803-2980
SMPTE	Society of Motion Picture and Television Engineers www.smpte.org	(914) 761-1100
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division) www.sprayfoam.org	(800) 523-6154
SPIB	Southern Pine Inspection Bureau (The) www.spib.org	(850) 434-2611
SPI/SPFD	Society of the Plastics Industry, Inc. (The) Spray Polyurethane Foam Division (See SPFA)	
SPRI	SPRI (Single Ply Roofing Institute) www.spri.org	(781) 647-7026
SSINA	Specialty Steel Industry of North America www.ssina.com	(800) 982-0355 (202) 342-8630
SSPC	SSPC: The Society for Protective Coatings www.sspc.org	(877) 281-7772 (412) 281-2331

STI	Steel Tank Institute www.steeltank.com	(847) 438-8265
SWI	Steel Window Institute www.steelwindows.com	(216) 241-7333
SWRI	Sealant, Waterproofing, & Restoration Institute www.swrionline.org	(816) 472-7974
TCA	Tile Council of America, Inc. www.tileusa.com	(864) 646-8453
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance www.tiaonline.org	(703) 907-7700
TMS	The Masonry Society www.masonrysociety.org	(303) 939-9700
TPI	Truss Plate Institute, Inc. www.tpinst.org	(608) 833-5900
TPI	Turfgrass Producers International www.turfgrasssod.org	(800) 405-8873 (847) 705-9898
UL	Underwriters Laboratories Inc. www.ul.com	(800) 704-4050 (847) 272-8800
UNI	Uni-Bell PVC Pipe Association www.uni-bell.org	(972) 243-3902
USITT	United States Institute for Theatre Technology, Inc. www.usitt.org	(800) 938-7488 (315) 463-6463
WASTEC	Waste Equipment Technology Association www.wastec.org	(800) 424-2869 (202) 244-4700
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org	(800) 283-1486 (503) 639-0651
WCMA	Window Covering Manufacturers Association (See WCSC)	
WCSC	Window Covering Safety Council (Formerly: WCMA - Window Covering Manufacturers Association) www.windowcoverings.org	(800) 506-4636 (212) 661-4261
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and	(800) 223-2301 (847) 299-5200

	Door Association) www.wdma.com	
WIC	Woodwork Institute of California www.wicnet.org	(916) 372-9943
WMMPA	Wood Moulding & Millwork Producers Association www.wmmpa.com	(800) 550-7889 (530) 661-9591
WSRCA	Western States Roofing Contractors Association www.wsrca.com	(800) 725-0333 (650) 548-0112
WWPA	Western Wood Products Association www.wwpa.org	(503) 224-3930

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

BOCA	BOCA International, Inc. www.bocai.org	(708) 799-2300
CABO	Council of American Building Officials (See ICC)	
IAPMO	International Association of Plumbing and Mechanical Officials (The) www.iapmo.org	(909) 595-8449
ICBO	International Conference of Building Officials www.icbo.org	(800) 284-4406 (562) 699-0541
ICBO ES	ICBO Evaluation Service, Inc. www.icbo.org/ICBO_ES/	(800) 423-6587
ICC	International Code Council, Inc. (Formerly: CABO - Council of American Building Officials) www.intlcode.org	(703) 931-4533
SBCCI	Southern Building Code Congress International, Inc. www.sbcci.org	(205) 591-1853

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

CE	Army Corps of Engineers www.usace.army.mil	
CPSC	Consumer Product Safety Commission www.cpsc.gov	(800) 638-2772 (301) 504-0990
DOC	Department of Commerce www.doc.gov	(202) 482-2000
EPA	Environmental Protection Agency www.epa.gov	(202) 260-2090
FAA	Federal Aviation Administration www.faa.gov	(202) 366-4000
FDA	Food and Drug Administration www.fda.gov	(888) 463-6332
GSA	General Services Administration www.gsa.gov	(202) 708-5082
HUD	Department of Housing and Urban Development www.hud.gov	(202) 708-1112
LBL	Lawrence Berkeley Laboratory (See LBNL)	
LBNL	Lawrence Berkeley National Laboratory www.lbl.gov	(510) 486-5605
NCHRP	National Cooperative Highway Research Program (See TRB)	
NIST	National Institute of Standards and Technology www.nist.gov	(301) 975-6478
OSHA	Occupational Safety & Health Administration www.osha.gov	(800) 321-6742 (202) 693-1999
PBS	Public Building Service (See GSA)	
RUS	Rural Utilities Service (See USDA)	(202) 720-9540

SD	State Department www.state.gov	(202) 647-4000
TRB	Transportation Research Board www.nas.edu/trb	(202) 334-2934
USDA	Department of Agriculture www.usda.gov	(202) 720-2791
USPS	Postal Service www.usps.com	(202) 268-2000

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

CAPUC	(See CPUC)	
CBHF	State of California, Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation www.dca.ca.gov/bhfti	(800) 952-5210 (916) 574-2041
CPUC	California Public Utilities Commission www.cpuc.ca.gov	(415) 703-2782
TFS	Texas Forest Service Forest Products Laboratory www.txforestservice.tamu.edu	(936) 639-8180

PART 2 – NOT USED

PART 3 – NOT USED

END OF SECTION 01420

SECTION 01500 - 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. Divisions 2 through 16 Sections for temporary heat, ventilation, and humidity requirements for products in those Sections.
   5. Division 2 Section "Hot-Mix Asphalt Paving" for construction and maintenance of asphalt paving for temporary roads and paved areas.
   6. Division 2 Section "Cement Concrete Pavement" for construction and maintenance of cement concrete pavement for temporary roads and paved areas.

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: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to Architect testing agencies, and authorities having jurisdiction.

B. Sewer Service per General Conditions: Pay sewer service use charges for sewer usage by all entities for construction operations.

C. Water Service per General Conditions: Pay water service use charges for water used by all entities for construction operations.

D. Electric Power Service per General Conditions: Pay electric power service use charges for electricity used by all entities for construction operations.

1.5 SUBMITTALS

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

1.6 QUALITY ASSURANCE

1. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.7 PROJECT CONDITIONS

A. Temporary Utilities: At earliest feasible time, when acceptable to Owner, change over from use of temporary service to use of permanent service.

1. 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.

B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:

1. Keep temporary services and facilities clean and neat.
2. Relocate temporary services and facilities as required.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pavement: Comply with Division 2 Section "Hot-Mix Asphalt Paving." Section "Cement Concrete Pavement." pavement Sections.

B. 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 concrete or galvanized steel bases for supporting posts.

C. Lumber and Plywood: Comply with requirements in Division 6 Section "Rough Carpentry."

D. Paint: Comply with requirements in Division 9 painting Sections.

E. Tarpaulins: Fire-resistive labeled with flame-spread rating of 15 or less.

F. Water: Potable.

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Common-Use Field Office: Of sufficient size to accommodate needs of construction personnel, including District Project Manager and Inspector. Keep office clean and orderly. Furnish and equip offices as follows:
   1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
   2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with not less than 1 receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- square tack board.
   3. Drinking water and private toilet.
   4. Coffee machine and supplies.
   5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
   6. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.

C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
   1. Store combustible materials apart from building.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. Heating Equipment: Unless Owner authorizes use of permanent heating system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
   1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
   2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.

D. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.
   1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
   1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction
   2. Filter out excessive soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
   3. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. After heavy use, restore normal conditions promptly.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction. Sterilize temporary piping before use.

D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
   1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility.
   2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy.
   3. Wash facilities: Install wash facilities supplied with potable water at convenient locations for personnel who handle materials that require wash up. Dispose of drainage properly. Supply cleaning compounds appropriate for each type of material handled.
   4. Drinking-Water Facilities: Provide bottled-water, drinking-water units.
   5. Locate toilets and drinking-water fixtures so personnel need not walk more than two stories vertically or 200 feet (60 m) horizontally to facilities.

E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
   1. Maintain a minimum temperature of 50 deg F in permanently enclosed portions of building for normal construction activities, and 65 deg F for finishing activities and areas where finished Work has been installed.

G. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
   1. Install electric power service overhead, unless otherwise indicated.

2. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
3. Provide metal conduit, tubing, or metallic cable for wiring exposed to possible damage. Provide rigid steel conduits for wiring exposed on grades, floors, decks, or other traffic areas.
4. Provide metal conduit enclosures or boxes for wiring devices.
5. Provide 4-gang outlets, spaced so 100-foot extension cord can reach each area for power hand tools and task lighting. Provide a separate 125V ac, 20-A circuit for each outlet.

H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
2. Provide one 100-W incandescent lamp per 500 sq. ft., uniformly distributed, for general lighting, or equivalent illumination.
3. Provide one 100-W incandescent lamp per 50 ft. of traffic areas.
4. Provide one 100-W incandescent lamp per story in stairways and ladder runs, located to illuminate each landing and flight.
5. Install exterior-yard site lighting that will provide adequate illumination for construction operations, traffic conditions, and signage visibility when the Work is being performed.

I. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line(s) for each field office.
1. Provide additional telephone lines for the following:
   a. Provide a dedicated telephone line for each facsimile machine and computer in each field office.
   b. In field office with more than two occupants, install a telephone for each additional occupant or pair of occupants.
2. At each telephone, post a list of important telephone numbers.
   a. Police and fire departments.
   b. Ambulance service.
   c. Contractor's home office.
   d. Architect's office.
   e. Engineers' offices.
   f. Owner's office.
   g. Principal subcontractors' field and home offices.
3. Provide superintendent with cellular telephone for use when away from field office.
4. Provide voicemail on superintendent’s telephone.

J. Electronic Communication Service: Provide temporary electronic communication service, including electronic mail, in common-use facilities.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.
2. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet of building lines. Comply with NFPA 241
3. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas as indicated on Drawings.
1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.

C. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas in same location as permanent roads and paved areas. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Division 2 Section "Earthwork."
3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course according to Division 2 Section "Hot-Mix Asphalt Paving."

D. 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.

E. Parking: Provide temporary parking areas for construction personnel.

F. 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.

G. Project Identification and Temporary Signs: Provide Project identification and other signs as indicated on Drawings. Install signs where indicated to inform public and individuals seeking entrance to Project. Unauthorized signs are not permitted.
1. Provide temporary, directional signs for construction personnel and visitors.
2. Engage an experienced sign painter to apply graphics for Project identification signs. Comply with details indicated.
3. Construct signs of exterior-type Grade B-B high-density concrete form overlay plywood in sized and thicknesses indicated. Support on posts or framing of preservative-treated wood or steel.

4. Paint sign panel and applied graphics with exterior-grade alkyd gloss enamel over exterior primer.
5. Maintain and touchup signs so they are legible at all times.

H. 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.
1. If required by authorities having jurisdiction, provide separate containers, clearly labeled, for each type of waste material to be deposited.
2. Develop a waste management plan for Work performed on Project. Indicate types of waste materials Project will produce and estimate quantities of each type. Provide detailed information for on-site waste storage and separation of recyclable materials. Provide information on destination of each type of waste material and means to be used to dispose of all waste materials.

I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

J. Temporary Elevator Use: Refer to Division 14 Sections for temporary use of new elevators.

K. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.

L. 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. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials.

F. 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.
   2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide Owner with one set of keys.

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 standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.

I. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
   1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

J. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241 and 1998 California Fire Code Article 87 during all phases of project.
   1. Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with sign mounted above.
      a. Field Offices: Class A stored-pressured water-type extinguishers.
      b. Other Locations: Class ABC dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for exposures.
      c. Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell.
   2. Store combustible materials in container in fire-safe location.
   3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire-exposure areas.
   4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
   5. Permanent Fire Protection: At earliest feasible date in each area of Project, complete installation of permanent fire-protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.

6. Develop and supervise an overall fire-prevention and first-aid fire-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.
7. Provide hoses for fire protection of sufficient length to reach construction areas. 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. Operate Project-identification-sign lighting daily from dusk until 12:00 midnight.

D. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

E. 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. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
3. 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 01500

SECTION 01600 - 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; product substitutions; and comparable products.

B. Related Sections include the following:
   1. Division 1 Section "Allowances" for products selected under an allowance.
   2. Division 1 Section "Alternates" for products selected under an alternate.
   3. Division 1 Section "References" for applicable industry standards for products specified.
   4. Division 1 Section "Closeout Procedures" for submitting warranties for Contract closeout.
   5. Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

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

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type,

function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.4 SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Substitution Request Form: Use form included in this 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, 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.
      m. Contractor’s agreement that additional costs to other contractors or for engineering or detailing costs caused by the propped substitution will be paid by the contractor.
   3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

1.5 QUALITY ASSURANCE

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

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

B. Delivery and Handling:
   1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
   2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
   3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
   4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

C. Storage:
   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.
   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 Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.

C. 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. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.

6. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed, or an unnamed manufacturer, that complies with requirements. Comply with provisions in Part 2 "Substitution Request" Article for consideration of an unnamed product.
7. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.
8. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 2 "Substitution Request" Article for consideration of an unnamed product by the other named manufacturers.
9. 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.
10. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.
    a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
    b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

A. Timing: Architect will consider requests for substitution if received prior to award of contract or within 35 days after the opening of bids, which ever occurs first.

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.
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.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01600

REQUEST FOR SUBSTITUTION

Substitution No. _____

We hereby submit for consideration, the following material, equipment, or method substitution of the specified or indicated item:

SPECIFICATION SECTION (OR DRAWING)	PARAGRAPH (OR DETAIL)	SPECIFIED OR INDICATED ITEM
_____	_____	_____

Proposed substitution: _____

The following materials are attached where applicable:

1) Complete dimensional information and technical data, including laboratory tests.

2) Complete information on changes to drawings and/or specifications, which are required for proper installation of the proposed substitution.

3) All samples and substantiating data necessary to substantiate equal quality, capacity and serviceability to the specified or indicated item. Clearly mark manufacturer's literature to indicate equality in performance. Differences in quality of materials and construction shall be indicated.

FILL IN BLANKS BELOW:

A. What is (are) the reason(s) for the proposed substitution:

_____ Availability
_____ Quality
_____ Workability
_____ Other: _____
_____ Cost
_____ Previous Experience
_____ Schedule

B. Does the substitution affect dimensions shown on Drawings:
Yes___ No___ If yes, clearly indicate changes. _____

C. The undersigned agrees to pay for changes to the building design, including engineering and detailing costs caused by the requested substitution:
Yes___ No___

D. What effect does the substitution have on other trades: _____

E. What effect does this substitution have on applicable code requirements: _____

Substitution No.

F. Differences between the proposed substitution and the specified or indicated item:_____

G. What is your previous experience with this proposed substitution:_____

H. The proposed substitution will provide a cost savings of_____dollars.

I. The proposed substitution will provide a schedule____reduction (or____extension) of calendar days.

J. Manufacturer's guarantee of the proposed and specified items are:
___same ___different (explain) _____

_____

CERTIFICATION OF EQUAL QUALITY, CAPACITY, AND SERVICEABILITY AND ASSUMPTION OF LIABILITY THEREFORE

Submitted By:

_____
Signature Date

_____
Name (Print) Title

_____
Firm

_____
Address

_____
City State Zip

_____
Telephone

Signature must be by a person having the authority to legally bind his or her firm to the above terms. Failure to provide a legally binding signature will nullify approval.

SECTION 01700 - 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. Construction layout.
   2. Field engineering and surveying.
   3. General installation of products.
   4. Coordination of Owner-installed products.
   5. Progress cleaning.
   6. Starting and adjusting.
   7. Protection of installed construction.
   8. 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 "Cutting and Patching" for procedural requirements for cutting and patching necessary for the installation or performance of other components of the Work.
   4. 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.

1.3 SUBMITTALS

A. Certificates: Submit certificate signed by professional engineer certifying that location and elevation of improvements comply with requirements.

B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.4 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

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, 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. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
      a. Description of the Work.
      b. List of detrimental conditions, including substrates.
      c. List of unacceptable installation tolerances.
      d. Recommended corrections.
   2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
   3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
   4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
   5. 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 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 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect and Construction Manager promptly.

B. General: Engage a professional engineer to lay out the Work using accepted surveying practices.
   1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
   2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
   3. Inform installers of lines and levels to which they must comply.
   4. Check the location, level and plumb, of every major element as the Work progresses.
   5. Notify Architect and Construction Manager when deviations from required lines and levels exceed allowable tolerances.
   6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and Construction Manager.

3.4 FIELD ENGINEERING

A. Identification: Owner will identify existing benchmarks, control points, and property corners.

B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
   1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect or Construction Manager. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate

permanent benchmarks or control points to Architect and Construction Manager before proceeding.

2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

3.5 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.

3.6 OWNER-INSTALLED PRODUCTS

A. Site Access: Provide access to Project site for Owner's construction forces.

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction forces.
1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
2. Preinstallation Conferences: Include Owner's construction forces at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction forces if portions of the Work depend on Owner's construction.

3.7 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.

3.8 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."

3.9 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. Comply with manufacturer's written instructions for temperature and relative humidity.

3.10 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching."
   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 01700

SECTION 01731 - CUTTING AND PATCHING

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 procedural requirements for cutting and patching.

B. Related Sections include the following:
   1. Divisions 2 through 16 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
   2. Division 7 Section "Through-Penetration Firestop Systems" for patching fire-rated construction.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 SUBMITTALS

A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
   1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
   2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
   3. Products: List products to be used and firms or entities that will perform the Work.
   4. Dates: Indicate when cutting and patching will be performed.
   5. Utility Services and Mechanical/Electrical Systems: List services/systems that cutting and patching procedures will disturb or affect. List services/systems that will be relocated and those that will be temporarily out of service. Indicate how long services/systems will be disrupted.
   6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
   7. Architect's and Construction Manager's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.5 QUALITY ASSURANCE

A. Roofing Elements:
   1. Standards: Perform cutting and patching work in compliance with recommendations of the National Roofing Contractor's Association "Roofing and Waterproofing Manual".
   2. Installer Qualifications: Arrange for cutting and patching of roofing systems by firm experienced in similar work, and licensed by manufacturer of roofing system to perform required repair work.
   3. Pre-Construction Conference: Arrange and attend meeting with Owner's Representative, representative of Owner's maintenance department, and representative of roofing firm to determine procedures for cutting and patching roofing system.

B. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

C. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operating elements include the following:
   1. Primary operational systems and equipment.
   2. Air or smoke barriers.
   3. Fire-suppression systems.
   4. Mechanical systems piping and ducts.
   5. Control systems.
   6. Communication systems.
   7. Conveying systems.
   8. Electrical wiring systems.
   9. Operating systems of special construction in Division 13 Sections.

D. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Miscellaneous elements include the following:
   1. Water, moisture, or vapor barriers.
   2. Membranes and flashings.
   3. Equipment supports.
   4. Piping, ductwork, vessels, and equipment.
   5. Noise- and vibration-control elements and systems.

E. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

F. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or

damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

B. Roofing contractor shall provide 2 year workmanship warranty for patching.
   1. Warranty patching work must be performed in a manner which will not void the manufacturer's warranty. Installers must be licensed by the roofing manufacturer to perform patching work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
   1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and result in equal or better functional performance characteristics of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
   1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
   2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

3.3 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
   1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Before cutting and patching roofing materials, obtain the Construction Managers approval to proceed.

C. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and

similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

D. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
    a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    b. Restore damaged pipe covering to its original condition.
3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
    a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even- plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

E. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 01731

SECTION 01770 - 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. Inspection procedures.
   2. Project Record Documents.
   3. Operations and Maintenance Manuals.
   4. Warranties.
   5. Instruction of Owner’s Personnel.
   6. 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 "Photographic Documentation" for submitting Final Completion construction photographs and negatives.
   3. Division 1 Section "Execution Requirements" for progress cleaning of Project site.
   4. Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
   5. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
   6. Division 1 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
   7. Divisions 2 through 16 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, Final Completion construction photographs, 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.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, which must be completed or corrected before certificate will be issued.
   1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
   2. Results of completed inspection will form the basis of requirements for Final Completion.

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 Architect's 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. Submit pest-control final inspection report and warranty.
   5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
   1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

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 CSI Form 14.1A.
   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 of Substantial Completion is indicated.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. 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. 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.
   3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

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 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, elevator 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.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.

D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01770

SECTION 01781 - 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. Divisions 2 through 16 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 one set(s) of marked-up Record Prints.
   2. Number of Copies: Submit copies of Record Drawings as follows:
      a. Initial Submittal: Submit one set of plots from corrected Record CAD Drawings and one set of marked-up Record Prints. Architect will initial and date each plot and mark whether general scope of changes, additional information recorded, and quality of drafting are acceptable. Architect will return plots and prints for organizing into sets, printing, binding, and final submittal.
      b. Final Submittal: Submit one set(s) of marked-up Record Prints, one set(s) of Record Transparencies, and three copies printed from Record Transparencies. Print each Drawing, whether or not changes and additional information were recorded.
      c. Final Submittal: Submit one set(s) of marked-up Record Prints, one set(s) of Record CAD Drawing files, one set(s) of Record CAD Drawing plots, and three copies printed from record plots. Plot and print each Drawing, whether or not changes and additional information were recorded.
         1) Electronic Media: CD-R.

B. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit one 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 or Construction Change Directive.
      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. Record Transparencies: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect. When authorized, prepare a full set of corrected transparencies of the Contract Drawings and Shop Drawings.
   1. Incorporate changes and additional information previously marked on Record Prints. Erase, redraw, and add details and notations where applicable.
   2. Refer instances of uncertainty to Architect for resolution.
   3. Owner will furnish Contractor one set of transparencies of the Contract Drawings for use in recording information.
   4. Print the Contract Drawings and Shop Drawings for use as Record Transparencies. Architect will make the Contract Drawings available to Contractor's print shop.

C. Record CAD Drawings: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect. When authorized, prepare a full set of corrected CAD Drawings of the Contract Drawings, as follows:
   1. Format: Same CAD program, version, and operating system as the original Contract Drawings.
   2. Format: DWG Version Architectural Desktop 3.3 operating in Microsoft Windows operating system.
   3. Incorporate changes and additional information previously marked on Record Prints. Delete, redraw, and add details and notations where applicable.
   4. Refer instances of uncertainty to Architect for resolution.
   5. Architect will furnish Contractor one set of CAD Drawings of the Contract Drawings for use in recording information.
      a. Architect makes no representations as to the accuracy or completeness of CAD Drawings as they relate to the Contract Drawings.
      b. CAD Software Program: The Contract Drawings are available in Architectural Desktop 3.3.

D. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing Record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
   1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
   2. Consult Architect for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared Record Drawings into Record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.

E. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
   1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
   2. Record Transparencies: Organize into unbound sets matching Record Prints. Place transparencies in durable tube-type drawing containers with end caps. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.
   3. Record CAD Drawings: Organize CAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each CAD file.
   4. 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.

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.

END OF SECTION 01781

SECTION 01782 - 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, finishes, systems and equipment.

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. Divisions 2 through 16 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 an inspection for Substantial Completion. Include a complete operation and maintenance directory. Architect will return one copy of draft and mark whether general scope and content of manual are acceptable.

B. Final Submittal: Submit one 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. Gas leak.
   3. Water leak.
   4. Power failure.

5. Water outage.
6. System, subsystem, or equipment failure.
7. 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 warranties.

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 01782

SECTION 01820 - DEMONSTRATION AND TRAINING

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 instructing Owner's personnel, including the following:
   1. Demonstration of operation of systems, subsystems, and equipment.
   2. Training in operation and maintenance of systems, subsystems, and equipment.
   3. Demonstration and training videotapes.

B. Related Sections include the following:
   1. Division 1 Section "Allowances" for administrative and procedural requirements for demonstration and training allowances.
   2. Division 1 Section "Project Management and Coordination" for requirements for preinstruction conferences.
   3. Divisions 2 through 16 Sections for specific requirements for demonstration and training for products in those Sections.

C. Allowances: Furnish demonstration and training instruction time under the Demonstration and Training Allowance as specified in Division 1 Section "Allowances."

D. Unit Price for Instruction Time: Length of instruction time will be measured by actual time spent performing demonstration and training in required location. No payment will be made for time spent assembling educational materials, setting up, or cleaning up.

1.3 SUBMITTALS

A. Instruction Program: Submit two copies of outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
   1. At completion of training, submit one complete training manual(s) for Owner's use.

B. Qualification Data: For instructor.

C. Attendance Record: For each training module, submit list of participants and length of instruction time.

D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

E. Demonstration and Training Videotapes: Submit two copies within seven days of end of each training module.

1. Identification: On each copy, provide an applied label with the following information:
   a. Name of Project.
   b. Name and address of photographer.
   c. Name of Architect.
   d. Name of Contractor.
   e. Date videotape was recorded.
   f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
2. Transcript: Prepared on 8-1/2-by-11-inch paper, punched and bound in heavy-duty, 3- ring, vinyl-covered binders. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding videotape. Include name of Project and date of videotape on each page.

1.4 QUALITY ASSURANCE

A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 1 Section "Quality Requirements," experienced in operation and maintenance procedures and training.

C. Photographer Qualifications: A professional photographer who is experienced photographing construction projects.

D. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:
   1. Inspect and discuss locations and other facilities required for instruction.
   2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
   3. Review required content of instruction.
   4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.5 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections, and as follows:
   1. Motorized doors, including overhead coiling doors.
   2. Equipment, including stage equipment, projection screens, food-service equipment carillon and laboratory fume hoods
   3. Fire-protection systems, including fire alarm, fire pumps and fire-extinguishing systems.
   4. Intrusion detection systems.
   5. Conveying systems, including elevators and wheelchair lifts.
   6. HVAC systems, including air-handling equipment, air distribution systems and terminal equipment and devices.
   7. HVAC instrumentation and controls.
   8. Electrical service and distribution, including transformers, switchboards, panelboards, uninterruptible power supplies and motor controls.
   9. Lighting equipment and controls.
   10. Communication systems, including intercommunication, clocks and programming voice and data and television equipment.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:
   1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
      a. System, subsystem, and equipment descriptions.
      b. Performance and design criteria if Contractor is delegated design responsibility.
      c. Operating standards.
      d. Regulatory requirements.
      e. Equipment function.
      f. Operating characteristics.
      g. Limiting conditions.
      h. Performance curves.
   2. Documentation: Review the following items in detail:
      a. Emergency manuals.
      b. Operations manuals.
      c. Maintenance manuals.
      d. Project Record Documents.
      e. Identification systems.
      f. Warranties and bonds.
      g. Maintenance service agreements and similar continuing commitments.
   3. Emergencies: Include the following, as applicable:
      a. Instructions on meaning of warnings, trouble indications, and error messages.
      b. Instructions on stopping.
      c. Shutdown instructions for each type of emergency.
      d. Operating instructions for conditions outside of normal operating limits.

e. Sequences for electric or electronic systems.
f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:
   a. Startup procedures.
   b. Equipment or system break-in procedures.
   c. Routine and normal operating instructions.
   d. Regulation and control procedures.
   e. Control sequences.
   f. Safety procedures.
   g. Instructions on stopping.
   h. Normal shutdown instructions.
   i. Operating procedures for emergencies.
   j. Operating procedures for system, subsystem, or equipment failure.
   k. Seasonal and weekend operating instructions.
   l. Required sequences for electric or electronic systems.
   m. Special operating instructions and procedures.
5. Adjustments: Include the following:
   a. Alignments.
   b. Checking adjustments.
   c. Noise and vibration adjustments.
   d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
   a. Diagnostic instructions.
   b. Test and inspection procedures.
7. Maintenance: Include the following:
   a. Inspection procedures.
   b. Types of cleaning agents to be used and methods of cleaning.
   c. List of cleaning agents and methods of cleaning detrimental to product.
   d. Procedures for routine cleaning
   e. Procedures for preventive maintenance.
   f. Procedures for routine maintenance.
   g. Instruction on use of special tools.
8. Repairs: Include the following:
   a. Diagnosis instructions.
   b. Repair instructions.
   c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   d. Instructions for identifying parts and components.
   e. Review of spare parts needed for O&M

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.

B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
   1. Owner will furnish an instructor to describe Owner's operational philosophy.
   2. Owner will furnish Contractor with names and positions of participants.

C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
   1. Schedule training with Owner, through Construction Manager, with at least seven days' advance notice.

D. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.

E. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

3.3 DEMONSTRATION AND TRAINING VIDEOTAPES

A. General: Engage a qualified commercial photographer to record demonstration and training videotapes. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
   1. At beginning of each training module, record each chart containing learning objective and lesson outline.

B. Videotape Format: Provide high-quality VHS color videotape in full-size cassettes.

C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to show area of demonstration and training. Display continuous running time.

D. Narration: Describe scenes on videotape by dubbing audio narration off-site after videotape is recorded. Include description of items being viewed. Describe vantage point, indicating location, direction (by compass point), and elevation or story of construction.

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

END OF SECTION 01820

01920 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

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. Disposing of nonhazardous demolition and construction waste.

1.3 DEFINITIONS

A. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
B. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.
C. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner’s property.
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 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition and construction waste becomes property of Contractor.

PART 2 - PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged or recycled, 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.

END OF SECTION 01920

SECTION 02 4100
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Limitations on Contractor's use of site and premises.

B. Section 01 1000 - Summary: Description of items to be salvaged or removed for re-use by Contractor.

C. Section 01 5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

D. Section 01 6000 - Product Requirements: Handling and storage of items removed for salvage and relocation.

E. Section 01 7000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

~~F. Section 31 2323 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.~~

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction Current Edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations 2022.

1.04 SUBMITTALS

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

~~B. Site Plan: Showing:~~
~~1. Areas for temporary construction and field offices.~~

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

PART 3 EXECUTION

2.01 SCOPE

A. Remove other items indicated, for salvage, relocation, recycling, and [_____].

~~B. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 31 2200.~~

2.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
1. Obtain required permits.
2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
3. Provide, erect, and maintain temporary barriers and security devices.
4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
5. Do not close or obstruct roadways or sidewalks without permit.
6. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.

7. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

B. Do not begin removal until receipt of notification to proceed from Owner.

C. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.

D. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

E. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

F. Hazardous Materials: Comply with 29 CFR 1926 and state and local regulations.

2.03 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

2.04 SELECTIVE DEMOLITION FOR ALTERATIONS

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

B. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.

C. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, Telecommunications, and [_____]): Remove existing systems and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
   2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   3. Verify that abandoned services serve only abandoned facilities before removal.
   4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

D. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.

3. Repair adjacent construction and finishes damaged during removal work.
4. Patch as specified for patching new work.

2.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 26 01 00

ELECTRICAL GENERAL PROVISIONS

ARTICLE 1 SUMMARY

1.1 **This document is for use as a guide specification only and is not to be used directly as a bid specification. The intent is to outline the District standards for electrical products and installation at Vista Unified School District. Any deviation from these standards must be approved by the District**.

1.2 Where the words 'provide' or 'provision' are used, it shall be definitely interpreted as 'furnishing and installing complete in operating condition'. Where the words 'as indicated' or 'as shown' are used, it shall mean as shown on contract drawings.

ARTICLE 2 CONTRACTOR QUALIFICATIONS

2.1 The Contractor shall have a current California C-10 Electrical Contractor's license and all individuals working on this project shall have passed the Department of Industrial Relations Division of apprenticeship Standards – "Electrician Certification Program."

ARTICLE 3 CODES, PERMITS AND FEES

3.1 Comply with all applicable laws, ordinances, rules, regulations, codes, or rulings of governmental units having jurisdiction as well as standards of NFPA, and serving utility requirements.

3.2 Obtain permits, fees, inspections, meter and the like, associated with work in each section of this Division.

3.3 Installation procedures, methods and conditions shall comply with the latest requirements of the Federal Occupational Safety and Health Act (OSHA).

ARTICLE 4 STANDARDS

4.1 The following standard publications of the latest editions enforced and supplements thereto shall form a part of these specifications. All electrical work must, as a minimum, be in accordance with these standards.

4.1.1 The current California Electrical Code (CEC), Part 3 Title 24 CCR.
4.1.2 National Fire Protection Association.
4.1.3 Underwriters' Laboratories, Inc. (UL).
4.1.4 Certified Ballast Manufacturers' Association (CBM).
4.1.5 National Electrical Manufacturers' Association (NEMA).
4.1.6 Institution of Electrical & Electronics Engineers (IEEE).
4.1.7 American Society for Testing & Materials (ASTM).
4.1.8 National Board of Fire Underwriters (NBFU).
4.1.9 National Board of Standards (NBS).
4.1.10 American National Standards Institute (ANSI).
4.1.11 Insulated Power Cable Engineers Association (IPECS).
4.1.12 Electrical Testing Laboratories (ETL).
4.1.13 National Electrical Safety Code (NESC).
4.1.14 California Building Code (CBC), Part 2, Title 24 CCR.
4.1.15 California Fire Code (CFC), Part 9, Title 24, CCR.

4.1.16 NFPA 72 with California State Amendments
4.1.17 National Electrical Testing Association (NETA), 2010 or most current

ARTICLE 5 DEFINITIONS

5.1 Concealed: Hidden from sight, as in trenches, chases, hollow construction, or above furred spaces, hung ceilings - acoustical or plastic type, or exposed to view only in tunnels, attics, shafts, crawl spaces, unfinished spaces, or other areas solely for maintenance and repair.

5.2 Exposed, Non-Concealed, Unfinished Space: A room or space that is ordinarily accessible only to building maintenance personnel, a room noted on the 'finish schedule' with exposed and unpainted construction for walls, floors, or ceilings or specifically mentioned as 'unfinished'.

5.3 Finish Space: Any space ordinarily visible, including exterior areas.

ARTICLE 6 WORK AND MATERIALS

6.1 Unless otherwise specified, all materials must be new of the best quality and be manufactured within the last 2 years. Materials previously incorporated into other projects, salvaged, or refurbished are not considered new. Perform all labor in a thorough and workmanlike manner.

6.2 All materials provided under the contract must bear the UL label where normally available. Note that this requirement may be repeated under equipment specifications. In general, such devices as will void the label should be provided in separate enclosures and wired to the labeled unit in proper manner.

ARTICLE 7 IDENTIFICATION OF EQUIPMENT

7.1 All electrical equipment shall be labeled, tagged, stamped, or otherwise identified in accordance with the following schedules:

7.1.1 General:

7.1.1.1 In general, the installed laminated nameplates as hereinafter called for shall also clearly indicate its use, areas served, circuit identification, voltage and any other useful data.

7.1.1.2 All auxiliary systems, including communications, shall be labeled to indicate function.

7.1.2 Lighting and Local Panelboards:

7.1.2.1 Panel identification shall be black with white lettering micarta nameplates. Where panel is fed from shall also be noted on nameplates. Example ‘ FED FROM DSB-A’. Letters shall be no less than 3/8" high.

7.1.2.2 Circuit directory shall be two column typewritten card set under glass or glass equivalent. Each circuit shall be identified by the room number and/or number of unit and other pertinent data as required.

7.1.3 Distribution Switchboards and Feeders Sections:

7.1.3.1 Identification shall be with 1" x 4" laminated white micarta nameplates with black lettering on each major component, each with name and/or number of unit and other pertinent data as required. Letters shall be no less than 3/8" high. Standby or emergency power shall have red lettering.

7.1.3.2 Circuit breakers and switches shall be identified by number and name with 3/8" x 1-1/2" laminated micarta nameplates with 3/16" high letters mounted adjacent to or on circuit breaker or switch.

7.1.4 Disconnect Switches, Motor Starters and Transformers:

7.1.4.1 Identification shall be with white micarta laminated labels and 3/8" high black lettering.

7.1.5 All communication system terminal boxes including T.V., telephone/intercom, security, fire alarm, clock, and computer networking shall be provided with white micarta laminated labels and 3/8" high black lettering.

ARTICLE 8 PLUMBING (DIVISION 22) / HEATING, VENTILATING, AND AIR CONDITIONING (DIVISION 23) / ELECTRICAL – COORDINATION REQUIREMENTS

8.1 All electrical work performed for this project shall conform to the California Electrical Code, to Local Building Codes and in conformance with Division 22, 23, and 26 of these specifications, whether the work is provided under the “Plumbing”, “Heating, Ventilating, and Air Conditioning”, or the “Electrical” Division of these specifications. Where the Division 22 and/or Division 23 Contractor is required to provide electrical work, he shall arrange for the work to be done by a licensed Division 26 Contractor, using qualified electricians. The Division 22 and/or Division 23 Contractor shall be solely and completely responsible for the correct functioning of all equipment regardless of who provided the electrical work.

8.2 The work under Division 22 and/or Division 23 shall include the following:

8.2.1 All motors required by mechanical equipment.

8.2.2 All starters for mechanical equipment which are not provided under the electrical division as part of a motor control center or otherwise indicated on the electrical drawings.

8.2.3 All wiring interior to packaged equipment furnished as an integral part of the equipment.

8.2.4 All control **wiring and conduit** for mechanical control systems.

8.2.5 All control systems required by mechanical equipment.

8.3 The work under Division 26 shall include the following:

8.3.1 All power wiring and conduit; and conduit only for EMS control conductors between each building and the main control panel.

8.3.2 Electrical disconnects as shown on the electrical drawings.

8.3.3 Starters forming part of a motor control center.

8.4 All power wiring and conduit to equipment furnished under Division 22 and/or Division 23 shall be provided under Division 26. Control wiring and conduit, whether line voltage or low voltage, shall be provided under the division which furnishes the equipment.

8.5 Power wiring shall be defined as all wiring between the panelboard switchboard overcurrent device, motor control center starter or switch, and the safety disconnect switch or control panel serving the equipment. Also, the power wiring between safety disconnect switch and the equipment line terminals.

8.6 Control wiring shall be defined as all wiring, either line voltage or low voltage, required for the control and interlocking of equipment, including but not limited to wiring to motor control stations, solenoid valves, pressure switches, limit switches, flow switches, thermostats, humidistats, safety devices, smoke detectors, and other components required for the proper operation of the equipment.

8.7 All motor starters which are not part of motor control centers and which are required for equipment furnished under this Division shall be furnished and installed by the Division furnishing the equipment and power wiring connected under Division 26. Motor starters and control devices in motor control centers shall be furnished and installed under Division 26.

8.8 Division 26 Contractor shall make all final connections of power wiring to equipment furnished under this Division.

8.9 Wiring diagrams complete with all connection details shall be furnished under each respective Section.

8.10 Motor starters supplied by Plumbing and/or Heating, Ventilating and Air Conditioning shall be fused combination type minimum NEMA Size 1, and conform to appropriate NEMA standards for the service required. Provide NEMA type 3R/12 gasketed enclosures in wet locations. Provide all starters with appropriately sized overload protection and heater strips provided in each phase, hand/off auto switches, a minimum of 2 NO and NC auxiliary contacts as required, and an integral disconnecting means. For ½ horsepower motors and below, when control requirements do not dictate the use of a starter, a manual motor starter switch with overload protection in each phase may be provided. Acceptable manufacturers are Allen Bradley, General Electric, Square D, Furnas and Cutler Hammer.

ARTICLE 9 GENERAL WIRING

9.1 Where located adjacent in walls, outlet boxes shall not be placed back to back, nor shall extension rings be used in place of double boxes, all to limit sound transmission between rooms. Provide short horizontal nipple between adjacent outlet boxes, which shall have depth sufficient to maintain wall coverage in rear by masonry wall.

9.2 In those instances where outlet boxes, recessed terminal boxes, or recessed equipment enclosures are installed in a fire rated assembly, provide "Flamesafe FSD 1077" fire stopping pads or approved equal, over the outlet or box.

9.3 Complete rough-in requirements of all equipment to be wired under the contract are not indicated. Coordinate with respective trades furnishing equipment or with the Architect as the case may be for complete and accurate requirements to result in a neat, workmanlike installation.

ARTICLE 10 SEPARATE CONDUIT SYSTEMS

10.1 Each electrical and signal system shall be contained in a separate conduit system as shown on the drawings and as specified herein. This includes each power system, each lighting system, each signal system of whatever nature, telephone, standby system, sound system, control system, fire alarm system, etc.

10.2 Further, each item of building equipment must have its own run of power wiring. Control wiring may be included in properly sized conduit for equipment feeders of #6 AWG and smaller, having separate conduit for larger sizes.

ARTICLE 11 GENERAL DEMOLITION REQUIREMENTS

11.1 Remove existing work and items which are required to be removed in such manner that minimum damage and disturbance is caused to adjacent and connection work scheduled to remain. Repair or replace existing work schedule.

11.2 Include preparation of existing areas to receive new materials and removal of materials and equipment to alter or repair the existing building as indicated and as specified.

11.3 Perform demolition exercising proper care to prevent injury to the public, workmen and adjoining property.

11.4 Perform the removal, cutting, drilling of existing work with extreme care and use small tools in order not to jeopardize the structural integrity of the building.

11.5 Rebuild to existing condition or better, existing work which has to be removed to allow the installation of new work as required.

11.6 Remove, protect and reinstall existing items as indicated. Replace materials scheduled for reuse which are damaged by the Contractor to the extent that they cannot be reused, with equal quality material, and installation.

11.7 Do not reuse in this project materials and items removed from existing site or building, except with specific written approval by the Architect in each case, unless such removed material or item is specifically indicated or specified to be reused.

11.8 Remove materials and equipment indicated to be salvaged for reinstallation and store to prevent damage, and reinstall as the work progresses. Do not reuse in this project, other materials and equipment removed from existing site or building, except with specific written approval by the Architect in each case.

11.9 Patch areas requiring patching, including damage caused by removing, relocating or adding fixtures and equipment, damages caused by demolition at adjacent materials.

11.10 Do not stockpile debris in the existing building, without the approval of the Architect. Remove debris as it accumulates from removal operations to a legal disposal area.

11.11 Contractor to assume existing oil filled and dry transformers, oil switches, ballasts, lamps, wooden poles, cross arms, computers, computer monitors, and conductor insulation containing materials considered hazardous. Comply with local, state and federal regulations, laws, and ordinances concerning removal, handling and protection against exposure or environmental pollution. Contractor shall be responsible for removal of the above hazardous materials where encountered. Include all costs for such removal as part of this contract.

11.12 All fluorescent, compact fluorescent, high intensity discharge, metal halid, LED, mercury vapor, high and low pressure sodium, and neon lamps are to be disposed of as required by the California Waste Rule Regulations as described in the California Code of Regulations, Title 22, Division 4.5 and Chapter 23.

11.13 **Communication System:** Where new communication systems, (including telephone, intercom, clock, security, fire alarm, data, multimedia, CATV or lighting controls) are installed to replace existing systems, unless where otherwise directed the existing systems shall remain fully operational until the new system has been installed and tested. Demolition of the existing systems shall include removal of all equipment and associated wiring and exposed conduits and providing new blank covers for all abandoned device locations.

11.14 **Salvage Power Equipment:** The Contractor shall carefully remove all existing switchboards, panelboards, transformers, and confirm in writing which items the Owner wishes to keep. Owner requires all distribution equipment be returned to the College unless otherwise noted. These items shall be transported to the Owner's maintenance facilities by the Contractor. All remaining items shall be disposed of by the Contractor.

11.15 **Salvage Lighting Equipment:** The Contractor shall confirm in writing which items the Owner wishes to keep. These items shall be transported to the Owner's maintenance facilities by the Contractor. All remaining items shall be disposed of by the Contractor.

11.16 **Salvage Communication Equipment:** The Contractor shall carefully remove all communication devices (telephone, intercom, clock, security, fire alarm, data, multimedia, CATV or lighting controls) and box each type of devices separately. The Contractor shall deliver all items to the Owner's maintenance facility.

ARTICLE 12 PROJECT CLOSEOUT

12.1 Prior to completion of project, compile a complete equipment maintenance manual for all equipment supplied under sections of this Division, in accordance with Division 1 of these specifications and as described below.

12.2 Equipment Lists and Maintenance Manuals:

12.2.1 Prior to completion of job, Contractor shall compile a complete equipment list and maintenance manuals. The equipment list shall include the following items for every piece of material equipment supplied under this Section of the specifications:

12.2.1.1 Name, model, and manufacturer.

12.2.1.2 Complete parts drawings and lists.

12.2.1.3 Local supply for parts and replacement and telephone number.

12.2.1.4 All tags, inspection slips, instruction packages, etc., removed from equipment as shipped from the factory, properly identified as to the piece of equipment it was taken from.

12.3 Maintenance manuals shall be furnished for each applicable section of the specifications and shall be suitably bound with hard covers and shall include all available manufacturers' operating and maintenance instructions, together with "as-built" drawings to properly operate and maintain the equipment. The equipment lists and maintenance manuals shall be submitted in duplicate to the Architect for approval not less than 10

days prior to the completion of the job. The maintenance manuals shall also include the name, address, and phone numbers of all subcontractors involved in any of the work specified herein. Four copies of the maintenance manuals bound in single volumes shall be provided.

ARTICLE 13 RECORD DRAWINGS

13.1 The Division 26 Contractor shall maintain record drawings as specified in accordance with Division 1 of these specifications, and as noted below.

13.2 Drawings shall show locations of all concealed and exposed conduit runs, giving the number and size of conduit wires. Underground ducts shall be shown with cross section elevations and shall be dimensioned in relation to permanent structures to indicate their exact location. Drawing changes shall not be identified only with referencing CORs and RFIs, the drawings shall reflect all the actual changes made.

13.3 One set of record drawings in hard copy and on disk in AutoCAD latest format shall be delivered to the District in accordance with these specifications.

END OF SECTION

SECTION 26 05 19

POWER CONDUCTORS

PART 1 – GENERAL

1.1 **This document is for use as a guide specification only and is not to be used directly as a bid specification. The intent is to outline the District standards for electrical products and installation at Vista Unified School District. Any deviation from these standards must be approved by the District**.

1.2 Submittals: Submit manufacturers' data for the following items:

1.2.1 All cables and terminations

PART 2– PRODUCTS

2.1 Wire and cable Rated 120 volt to 600 volt.

2.1.1 All wire and cable shall be new, 600 volt insulated copper, of types specified below for each application. All wire and cable shall bear the UL label and shall be brought to the job in unbroken packages. Wire insulation shall be the color as specified herein and shall be type THWN-2. Insulated conductors shall be installed in all exterior exposed raceways. Conductors for branch circuit lighting, receptacle, power and miscellaneous systems shall be a minimum of No. 12 AWG. Increase conductor size to No. 10 AWG for 120 volt circuits greater than 100 feet from the panel to the load and for 277 volt circuits greater than 200 feet from the panel to the load. Circuit home-runs indicated to be larger than No. 12 must be increased the entire length of the circuit, including equipment grounding conductor. Wire sizes No. 14 through No. 10 shall be solid. No. 8 and larger shall be stranded. Neutral conductors shall be increased where shared with multiple conductors. Example, if conductors are # 12, neutral shall be # 10.

2.1.2 Aluminum conductors will be permitted in sizes 2/0 or larger. Conductors shall be listed by Underwriters Laboratories (UL) and suitable for operation at 600 volts or less, at a maximum operating temperature of 90E C maximum in wet or dry locations. Conductors shall be marked "SUN-RES". Aluminum alloy conductors shall be compact stranded conductors of STABILOY® (AA-8030) as manufactured by Alcan Cable or Listed equal. AA-8000 Series aluminum alloy conductor material shall be recognized by The Aluminum Association.

PART 3 - EXECUTION

3.1 Wire and cable shall be pulled into conduits without strain using approved lubricant. In no case shall wire be repulled if same has been pulled out of a conduit run for any purpose. No conductor shall be pulled into conduit until conduit system is complete, including junction boxes, pull boxes, etc.

3.2 All connections of wires shall be made as noted below:

3.2.1 Connections to outlets and switches: Wire formed around binding post of screw.

3.2.2 No. 10 wire and smaller: Circuit wiring connections to lighting fixtures and other hard wired equipment shall be made with pressure type solderless connectors,

Buchanan, Scotchlock, Wing Nut, or approved equal. Alternate "WAGO" #773 series or "IDEAL" #32, 33, 34 and 39 series push wire style connectors are also acceptable.

3.3 All wiring shall be continuous without splicing unless where specifically noted below.

3.3.1 No. 10 wire and smaller above grade: Quantities as needed, connection made with pressure type solderless connectors, Scotchlock or equal.

3.3.2 No. 10 wire and smaller below grade: Quantities as needed, connection made with 'Raychem' long barrel compression terminals with crimping tool and quantity of crimps as recommended by manufacturer, provide 'Raychem' WCSM-S series in-line heat shrink, sealant coated splice kit. Alternate projects must be UL listed for direct burial/submersible and rated to (1000V).

3.3.3 No. 8 wire and larger above grade: Quantities only where approved by the College, 'Raychem' long barrel compression terminals with crimping tool and quantity of crimps as recommended by manufacturer, provide 'Raychem' WCSM-S series in-line heat shrink, sealant coated splice kit. Alternate projects must be UL listed for direct burial/submersible and rated to (1000V).

3.3.4 No. 8 wire and larger below grade: Quantities only where approved by the College, 'Raychem' long barrel compression terminals with crimping tool and quantity of crimps as recommended by manufacturer, provide 'Raychem' WCSM-S series in-line heat shrink, sealant coated splice kit. Alternate projects must be UL listed for direct burial/submersible and rated to (1000V).

3.4 All wiring throughout shall be color coded as follows:

	480 volt system	208 or 240 volt system
A Phase	Brown	Black
B Phase	Orange	Red
C Phase	Yellow	Blue
Neutral	Grey	White
Ground	Green	Green

3.5 All wiring must be color coded throughout its entire length.

3.6 All control wiring in a circuit shall be color coded, each phase leg having a separate color, and with all segments of the control circuit, whether in apparatus or conduit, utilizing the same color coding. All control wiring must be color coded throughout its entire length.

3.7 At all terminations of control wiring, the wiring shall have a numbered T&B or Brady plastic wire marker.

3.8 Cables when installed are to be properly trained in junction boxes, etc., and in such a manner as to prevent any forces on the cable which might damage the cable.

3.9 All conductors to be installed into a common raceway, shall be pulled into the raceway at the same time.

3.10 All conductors shall be installed in such a manner as to not exceed the manufacturers' recommended pulling tension and bending radius. The equipment used for pulling must

be specifically designed for the purpose. Motorized vehicles such as pickup trucks, are not acceptable.

END OF SECTION

SECTION 26 05 26

GROUNDING

PART 1 – GENERAL

1.1 **This document is for use as a guide specification only and is not to be used directly as a bid specification. The intent is to outline the District standards for electrical products and installation at Vista Unified School District. Any deviation from these standards must be approved by the District**.

1.2 Submit catalog data for all components.

PART 2 – EXECUTION

2.1 Grounding

2.1.1 All panel board cabinets, equipment, enclosures, and complete conduit system shall be grounded securely in accordance with pertinent sections of CEC Article 250. Conductors shall be copper. All electrically operated equipment shall be bonded to the grounded conduit system. All non-current carrying conductive surfaces that are likely to become energized and subject to personal contact shall be grounded by one or more of the methods detailed in CEC Article 250. All ground connections shall have clean contact surfaces. Install all grounding conductors in conduit and make connections readily accessible for inspection.

2.1.2 Provide an insulated equipment grounding conductor in all branch circuit and feeder raceway systems, sized in accordance with CEC 250-95.

2.1.3 Grounding of metal raceways shall be assured by means of provisions of grounding bushings on feeder conduit terminations at the panelboard, and by means of insulated continuous stranded copper grounding wire extended from the ground bus in the panelboard to the conduit grounding bushings.

2.1.4 The following ohmic values shall be test certified by a third party testing lab for each item listed. If the ohmic value listed cannot be obtained additional grounding shall be installed to reach the value listed. Provide (3) written copies of final test results as part of close-out documentation.

2.1.4.1 Service . . . . . 10 ohms.

2.1.4.2 Step down transformers and non-current carrying metal parts . . . . . 25 ohms.

2.1.4.3 Manholes, hand holes, etc. . . . . 10 ohms.

END OF SECTION

SECTION 26 05 33

CONDUIT AND FITTINGS

PART 1 – GENERAL

1.1 **This document is for use as a guide specification only and is not to be used directly as a bid specification. The intent is to outline the District standards for electrical products and installation at Vista Unified School District. Any deviation from these standards must be approved by the District**.

1.2 Submit Manufacturer's data on all products:

PART 2 – PRODUCTS

2.1 Rigid steel conduit, intermediate metal conduit (IMC), electrical metallic tubing (EMT) and flexible metallic conduit shall be steel, hot dipped galvanized after fabrication.

2.2 PVC conduit shall be Carlon or approved equal.

2.3 Liquid tight flexible metal conduit shall be Anaconda Sealtite type UA or approved equal. Fittings shall be Appleton, Crouse-Hinds, Steel City, T&B, or equivalent.

2.4 MC type armored cable, when utilized, shall be provided with the following:

2.4.1 Comply with UL 1479 and CEC Art 330, 330-22(b).

2.4.2 90ºC, copper, THHN conductors.

2.4.3 Minimum #12 insulated grounding conductor.

2.4.4 Conductors sized No. 10 and smaller shall be solid, No. 8 and larger shall be stranded.

2.4.5 When more than one current carrying conductor is provided in the run on MC, a super neutral shall be provided.

2.4.6 Increase phase conductors to No. 10 AWG for 120 volt circuits greater than 100 feet from panel to load and for 277 volt circuits greater than 200 feet from panel to load. Where required increase conductor sizes for entire length of circuit.

2.4.7 Interlocked armored **aluminum** sheath.

2.4.8 AC or BX type armored cable shall **not** be substituted in lieu of MC type cable.

2.4.9 Acceptable manufacturers are AFC, Alflex or equal.

2.5 Fire stopping material shall provide an effective seal against fire, heat, smoke and fire gases. Fire stopping material shall be tested to comply with ASTME 814 and UL 1479. The submittal for this product shall include the UL listed system number and installation requirements for each type of penetration seal required for this project.

2.6 Each length of conduit shall be stamped with the name or trademark of the manufacturer and shall bear the UL label.

2.7 All plastic conduit shall be rigid, schedule 40, heavy wall PVC. All PVC conduit shall be UL listed. Underground utility company conduits shall comply with local utility co. requirements.

2.8 Plastic conduit shall be stored on a flat surface, and protected from the direct rays of the sun.

PART 3 – FITTINGS

3.1 All metallic fittings, including those for EMT, flexible conduit, and Type MC cable, shall be steel or malleable iron. Die cast fittings of any other material are not permitted.

3.2 Locknuts shall be steel or malleable iron with sharp clean cut threads.

3.3 Entrance seals shall be 0.Z. type FSK or equivalent.

3.4 Bushings and locknuts: Where conduits enter boxes, panels, cabinets, etc., they shall be rigidly clamped to the box by locknuts on the outside, and a lock nut and plastic bushing on the inside of the box. All conduits shall enter the box squarely.

3.5 Furnish and install insulated bushings as per CEC article No. 300 - 4 (F) on all conduits. The use of insulated bushings does not exclude the use of double locknuts to fasten conduit to the box.

3.6 Transition from plastic to steel conduits shall be with PVC female threaded adaptors.

3.7 Couplings and connectors for rigid steel or IMC conduit must be threaded, or compression type (set screw fittings are not permitted).

3.8 Couplings and connectors for EMT shall be compression, watertight. Set screw connectors are not acceptable, except for systems below 120 volts.

3.9 MC type armored cable shall be provided with listed set screw connectors. Anti-short bushings shall be provided at all cable ends.

3.10 Connectors for flexible metal conduit shall be steel or malleable iron with screw provided to clinch the conduit into the adapter body. For sizes up to ¾" a screw-in, "Jake type," fitting may be used.

3.11 Install approved expansion fittings, or liquid tight flex conduit with a minimum 6" slack for conduits passing through all expansion and seismic joints.

3.12 Condulet / LB fittings are not to be used except when transitioning from the exterior to the interior of a building.

PART 4 - EXECUTION

4.1 All branch circuits shall be installed concealed in walls or above ceilings or in concrete floor slabs. PVC conduits installed in concrete floor slabs shall transition to PVC coated rigid steel where conduits penetrate above finished grade or finished floor.

4.2 Conduit sizes for various numbers and sizes of wire shall be as required by the CEC, but not smaller than 3/4". Conduit in slab or below grade shall be ¾" minimum trade size, unless otherwise identified.

4.3 Conduit size shall be such that the required number and sizes of wires can be easily pulled in and the Contractor shall be responsible for the selection of the conduit sizes to facilitate the ease of pulling. Conduit sizes shown on the drawings are minimum sizes in accordance with appropriate tables in the CEC. If because of bends or elbows a larger conduit size is required, the Contractor shall so furnish without further cost to the Owner.

4.4 The Contractor shall be entirely responsible for the proper protection of this work from the other trades on the job. When conduit becomes bent or holes are punched through same, or outlets moved after being roughed-in, the Contractor shall replace same, without additional cost to the Owner

4.5 Rigid steel conduit or IMC shall be used as follows:

4.5.1 Exposed exterior locations.

4.5.2 Exposed interior locations below eight feet above floor, except in electrical rooms and closets.

4.5.3 In hazardous or classified areas as required by CEC.

4.5.4 All fire alarm conduit shall be red in color.

4.6 EMT conduit shall be used for areas as follows:

4.6.1 All interior communications, signal, and data networking systems.

4.6.2 All interior power wiring systems where not required to be in rigid steel, IMC or flexible conduit.

4.7 Flexible conduit shall be used for areas as follows:

4.7.1 To connect motors, transformers, and other equipment subjected to vibration or where specifically detailed on the drawings.

4.7.2 Flexible conduit shall not be used to replace EMT in other locations where the conduit will be exposed.

4.7.3 Flexible metal conduit shall be ferrous. Installation shall be such that considerable slack is realized. The conduit shall contain separate code sized grounding conductor.

4.7.4 Liquid tight flexible conduit shall be used in conformance with CEC in lengths not to exceed 4'. For equipment connections, route the conduit at 90 degrees to the adjacent path for point of connection. The conduit shall contain separate code sized grounding conductor. Use liquid tight flexible conduit for all equipment connections exposed in possible wet, corrosive or oil contaminated areas, e.g., shops and outside areas.

4.8 MC armored cable may be used as follows:

4.8.1 All branch circuit wiring for lighting and power circuits where permitted and installed in compliance with UL 1569 and CEC 330.

4.9 MC armored cable shall **not** be used for the following areas:

4.9.1 Any exterior, underground or buried in concrete circuits.

4.9.2 Any circuits feeding HVAC equipment or pumps or any circuit with 30 AMPs or greater overcurrent protection.

4.9.3 Any exposed interior locations except in electrical, communication or mechanical equipment rooms.

4.9.4 Any exposed interior damp/wet locations, kitchens, science classrooms, shop areas, or concealed in science classroom casework, unless provided with approved PVC jacket.

4.9.5 Any hazardous rated area.

4.10 All underground conduit depths shall be as a minimum of 30" below finished grade for all exterior underground conduits. Where concrete slurry or concrete encasement is provided, include “Red” color dye in mixture. Trench shall have a minimum of a 2” sand base with 3” clear spacing on all sides. All power conduits shall be placed on the bottom on the trench with Communication and control conduits on top or to the side with 6” spacing from power conduits. Trenches shall also have a warning/tracer tape placed at 12” below finished grade. Conduit for all conduits for medium voltage conductors shall be at a depth of 4’-0´minimum and capped with 4” of concrete. Selected backfill shall be free of large rock and debris and compacted to 90% relative density.

4.11 Provide all necessary sleeves and chases required where conduits pass through floors or walls as part of the work of this section. Core drilling will only be permitted where approved by the Architect.

4.12 All empty conduits and surface mounted raceways shall be provided with a ¼" polypropylene plastic pull cord and threaded plastic or metal plugs over the ends. Fasten plastic "Dymo" tape label to exposed spare conduit to identify "power" or "communication" system, and to where it goes.

4.13 The ends of all conduits shall be securely plugged, and all boxes temporarily covered to prevent foreign material from entering the conduits during construction. All conduit shall be thoroughly swabbed out with a dry swab to remove moisture and debris before conductors are drawn into place.

4.14 Bending: Changes in direction shall be made by bends in the conduit. These shall be made smooth and even without flattening the pipe or flaking the finish. Bends shall be of as long a radius as possible, and in no case smaller than CEC requirements.

4.14.1 For power conduits for conductors (600v and below), provide minimum 36” radius (vertical) and 72” radius (horizontal) bends.

4.14.2 For power conduits for conductors (greater than 600v), provide minimum 72” radius (vertical) and 72” radius (horizontal) bends.

4.15 Openings through fire rated floors/walls and/or smoke walls through which conduits pass shall be sealed by Fire stopping material to comply with Division 1 to seal off flame, heat, smoke and fire gases. Sleeves shall be provided for power or communication system cables which are not installed in conduits, and shall be sealed inside and out to comply with manufacturers UL system design details. Where multiple conduits and/or cable tray systems pass thru fire-rated walls at one location, the Contractor shall submit copies of

the manufacturers UL system design details proposed for use on this project. All Fire stopping material shall have an hourly fire-rating equal to or higher than the fire rating of the floor or wall through which the conduit, cables, or cable trays pass.

4.16 Provide cap or other sealing type fitting on all spare conduits. Conduits stubbed into buildings from underground where cable only extends to equipment, the conduit/cable end shall be sealed to prevent moisture from entering the room or space.

4.17 All conduits which are required as a part of systems specified in Divisions 27 or 28, or any other low voltage communication systems, shall be furnished and installed by the Division 26 Contractor.

4.17.1 The Contractor shall coordinate all conduit requirements with each system supplier prior to bid to determine special conduit system requirements.

4.17.2 The Contractor shall provide a pull rope in all conduits for these systems.

4.17.3 The Contractor shall provide conduit sleeves for all open cable installations thru rated walls or block walls. Provide conduit from each building main termination cabinet or backboard to the nearest accessible ceiling for access into all electrical or communications rooms.

4.18 In addition to the above requirements, the following requirements shall apply to all data networking conduits:

4.18.1 Flexible metal conduit may only be used where required at building seismic and/or expansion joints.

4.18.2 All underground conduits shall be provided with minimum 24" radius elbows (vertical) and 60” (horizontal).

4.18.3 No length of conduit above grade shall be installed to exceed 100 feet between pull boxes, or points of connection, unless where specifically detailed on the drawings.

4.18.4 No length of conduit shall be installed to exceed two 90 degree bends between pull boxes, or points of connection, unless where specifically detailed on the drawings.

4.18.5 All spare conduits must have a pull string and be permanently labeled with the designation.

4.19 Where surface raceways are installed in interior spaces, the Contractor shall take care to route in straight lines at right angles to or parallel with walls, beams, or columns. All raceways and device boxes shall be securely screwed to the finish surface with zinc screw “Auger” anchors Stk #ZSA1K by Gray Bar Electric or equal. Tape adhesive application will not be permitted.

4.20 The Contractor who installs surface raceway systems shall provide and install complete with wire retention clips, one for every (8) vertical feet or (5) horizontal feet or portion thereof. This Contractor shall also provide each raceway channel with pull strings.

4.21 It shall be the responsibility of the Contractor installing the raceway to coordinate the installation of raceway device plates and inserts with the communications or data contractors.

4.22 MC cable shall be cut using a specific metallic sheath armor stripping tool. The use of hacksaws, dikes or any other tools not specifically designed to remove the armor sheath will not be permitted.

4.23 MC cables installed in attic spaces or above lay-in ceilings shall be installed to be protected from physical damage. The cable shall be mounted along the sides or bottom of joists, rafters or studs.

4.24 Support wires used for supporting ceilings, lighting fixtures or other equipment items shall **not** be used to support MC cables. Conduits, duct work, piping or any other equipment shall not be used to support or mount MC cables.

4.25 MC cable supports, fasteners and clips shall be designed specifically for use with MC cables. Standard conduit supports, fasteners and clips, nails or other items are not permitted for installing MC cables.

END OF SECTION

SECTION 26 05 34

OUTLET AND JUNCTION BOXES

PART 1 – GENERAL

1.1 **This document is for use as a guide specification only and is not to be used directly as a bid specification. The intent is to outline the District standards for electrical products and installation at Vista Unified School District. Any deviation from these standards must be approved by the District**.

1.2 Submit manufacturer's data for all items.

PART 2 – PRODUCTS

2.1 Boxes shall be as manufactured by Steel City, Appleton, Raco, or approved equal.

2.2 All boxes must conform to the provisions of Article 370 of the CEC. All boxes shall be of the proper size to accommodate the quantity of conductors enclosed in the box. Minimum box size shall be 4" square x 1-½" deep.

2.3 Boxes generally shall be hot dipped galvanized steel with knockouts. Boxes on exterior surfaces or in damp locations shall be corrosion resistant, cast feraloy and shall have threaded hubs for rigid conduit and neoprene gaskets for their covers. Boxes shall be Appleton Type FS, Crouse-Hinds, or the approved equal. Conduit bodies shall be corrosion resistant, cast malleable iron and all types of condulets bodies shall only be used where approved for use by the college district. Conduit bodies shall have threaded hubs for rigid conduit and neoprene gaskets for their covers. Conduit bodies shall be Appleton Unilets, Crouse-Hinds, or the approved equal. Where recessed, boxes shall have square cut corners. All floor boxes shall be the product of FRS inc. or approved by the college.

2.4 Deep boxes shall be used in wall covered by wainscot or paneling and in walls or glazed tile, brick, or other masonry which will not be covered with plaster. Through the wall type boxes shall not be used unless specifically called for. All boxes shall be nongangable. Boxes in concrete shall be of a type to allow the placing of conduit without displacing the reinforcing bars. All lighting fixture outlet boxes shall be equipped with the proper fittings to support and attach a light fixture.

2.5 All light, switch, receptacle, and similar outlets shall be provided with approved boxes, suitable for their function. Back boxes shall be furnished and installed as required for the equipment and/or systems under this contract.

2.6 Pull and junction boxes shall be code gauge boxes with screw covers. Boxes shall be rigid under torsional and deflecting forces and shall be provided with angle from framing where required. Boxes shall be 4" square with a blank cover in unfinished areas and with a plaster ring and blank cover in finished areas. Covers for flush mounted oversize boxes shall extend ¾" past boxes all around. Covers for 4" square boxes shall extend ¼" past box all around.

2.7 All terminal cabinets and junction boxes or equipment back boxes which are required as a part of systems specified in Divisions 27 or 28, or any other low voltage communication systems, shall be furnished and installed by the Division 26 Contractor.

2.7.1 The Division 26 Contractor shall coordinate all box requirements with each system supplier prior to bid to determine special cabinet or back box requirements. The Contractor shall also provide stainless steel blank cover plates for all low voltage systems installed for future equipment.

2.7.2 The Contractor shall provide plywood backboards on all MDF/IDF room walls, covering all walls to 8' or to finished ceiling height if less than 8', as well as inside equipment enclosures. All backboards shall be a minimum of ¾" thick fire rated type plywood and painted white.

2.7.3 The Contractor shall coordinate exact rough in locations and requirements with each system supplier.

2.8 In addition to the above requirements, boxes for data networking wiring and equipment shall comply with the following:

2.8.1 All boxes shall be a minimum of 4-11/16" square x 2-c" deep.

2.8.2 Where pull boxes are required on individual conduits 1-¼" or smaller, provide 4-11/16" square x 2-c" deep boxes. Where pull boxes are required on conduits larger than 1-¼" for straight pull through, provide eight times the conduit trade size for box length. Where pull boxes are required on conduits larger than 1-¼" for an angle or a U-pull through installation, provide a minimum distance of six times the conduit trade size between the entering and exiting conduit run for each cable.

2.9 Recessed boxes installed in fire rated floors/walls and /or smoke walls shall be sealed by Fire stopping material to comply with Division 1 to seal off flame, heat, smoke and fire gases. The Contractor shall submit copies of the manufacturers UL system design details proposed for use on this project. All Fire stopping material shall have an hourly fire-rating equal to or higher than the fire rating of the floor or wall through which the conduit, cables, or cable trays pass.

PART 3 – EXECUTION

3.1 Boxes shall be installed where required to pull cable or wire, but in finished areas only by approval of the Architect. Boxes shall be rigidly attached to the structure, independent of any conduit support. Boxes shall have their covers accessible. Covers shall be fastened to boxes with machine screws to ensure continuous contact all around. Covers for surface mounted boxes shall line up evenly with the edges of the boxes.

3.2 Outlets are only approximately located on the plans and great care must be used in the actual location of the outlets by consulting the various detailed drawings and specifications. Outlets shall be flush with finished wall or ceiling, boxes installed symmetrically on such trim or fixture. Refer to drawings for location and orientation of all outlet boxes.

3.3 All outlet boxes and junction boxes for fire alarm system shall be painted red.

END OF SECTION

PART 1 GENERAL

1.1 PROJECT

A. Project Name: Theater Modernization – Lighting Controls System

B. Project Location: Mission Vista High School, 1306 Melrose Dr, Oceanside, CA 92057

C. Owner: Vista Unified School District

D. Audio/Video Designer: PAC Engineering

E. The Vista Unified School District is requesting bids for Mission Vista High School Theater Modernization - Lighting Control System. The installation will utilize the enclosed plans, specifications, and additional information included in this bid packet. The Lighting Control system includes an architectural lighting control system with multiple button stations, two seven-inch touchscreens, network switches, a wall rack, an uninterruptable power supply, and related hardware.

F. The Manufacturers included in the Lighting Control system design are the following but not limited to ETC, Cisco, and Middle Atlantic.

G. The Lighting Control Contractor needs to be an authorized ETC Service provider and Advanced Programmer to install, program, and commission the ETC equipment.

H. All ETC programming and GUI interfaces must be approved by the Owner.

I. Section 26 09 23 of the Lighting Controls specification describes the logical design, installation, wiring, interfaces, locations, hardware/software, testing, and documentation of the Lighting Control System. Failure to read/follow the information in this section along with the drawings/plans may result in an inaccurate bid and installation of the project.

J. This specification specifies installation standards, practices, and guidelines.

K. It is the Lighting Control Contractor’s responsibility to propose, acquire, and provide all items required for a complete operational system.

1.2 DEFINITIONS

A. C.B.C.: California Building Code.

B. C.C.R.: California Code of Regulations.

C. Furnish: To supply products to the project site, including delivery.

D. Install: To put products in place to be work-ready for the intended use, including unloading, unpacking, handling, storing, assembling, installing, erecting, placing, applying, anchoring, working, finishing, curing, protecting, cleaning, and similar operations.

E. Provide: To furnish and install products, equipment, and materials.

F. Indicated: Shown, noted, scheduled, specified, or drawn, somewhere in the Contract Documents.

G. Lighting Control Contractor: Qualified low voltage contractor/installer must have at least 5 years of experience installing ETC Lighting Control systems.

H. Owner or Client: shall refer to Vista Unified School District or their designated representative.

I. District: Vista Unified School District.

J. OFCI: Owner Furnished, Contractor installed.

K. Manufacturer: shall refer to the original manufacturer of any equipment provided as part of the work.

L. CFE: Client Furnished Equipment.

M. EE: Existing Equipment

1.3 REGULATORY REQUIREMENTS

A. The Lighting Control Contractor shall obtain any permits and shall pay all fees required by public agencies having jurisdiction over the work.

B. All products and materials provided shall be listed by the Underwriters Laboratory (UL) and shall bear the UL label intended for the purpose specified and indicated. If UL has no published standards for a particular item, then other national independent testing standards shall apply, and such items shall bear those labels.

C. The Lighting Control Contractor and their employees shall perform all work in compliance with current Occupational Safety and Health Administration (OSHA) guidelines and regulations and other safety and health requirements as may be mandated by the Owner, the Architect. or other authorities.

D. The Lighting Control Contractor shall have a thorough knowledge of governing codes and standards in effect and have jurisdiction over the Project. Lack of awareness of any of the relevant codes and standards will not be accepted as a reason for non-compliance.

E. The Lighting Control Contractor shall be responsible for providing cable and materials that comply with applicable codes and requirements of regulating bodies. The cost for these materials shall be included in the Bid price, as the Owner shall not accept change orders for changes in materials.

F. The following regulations apply to this project:

1. 2022 California Building Code, Title 24, Part 2, California Code of Regulations (C.C.R.).

2. 2022 California Electrical Code, Title 24, Part 3, California Code of Regulations (C.C.R.).

3. 2022 California Mechanical Code, Title 24, Part 4, California Code of Regulations (C.C.R.).

4. 2022 California Plumbing Code, Title 24, Part 5, California Code of Regulations (C.C.R.).

5. 2022 California Fire Code, Title 24, Part 9, California Code of Regulations (C.C.R.).

6. ANSI/EIA/TIA 568 E: Commercial Building Telecommunications Wiring Standard, current edition.

7. ANSI/EIA/TIA 569 E: Commercial Building Standard for Telecommunications Pathways and Spaces, current edition.

8. ANSI/EIA/TIA 607 C: Commercial Building Grounding and Bonding Requirements for Telecommunications, current edition.

9. ANSI/EIA 310-D: Equipment Racks and Panels.

1.4 CONTRACT DESCRIPTION

A. Contract Type: A single contract based on a stipulated price.

1.5 OWNER OCCUPANCY

A. Owner intends to occupy the project space upon substantial completion.

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

C. Schedule the work to accommodate Owner occupancy.

1.6 LIGHTING CONTROL CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on drawings/plans.

B. Arrange use of site and premises to allow:

1. Owner occupancy.

2. Work by others.

3. Work by Owner.

C. Provide access to and from the site as required by law and by the Owner:

1. Emergency Building Exits During Construction: Keep all exits required by code open during the construction period; provide temporary exit signs if exit routes are temporarily altered.

2. Do not obstruct roadways, sidewalks, or other public ways without a permit.

D. Time Restrictions:

1. Limit conduct of especially noisy exterior work to the hours regulated by the local jurisdiction.

E. Utility Outages and Shutdown:

1. Limit disruption of utility services to hours the site is unoccupied.

2. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm systems, without 48-hour notice to the Owner and authorities having jurisdiction.

3. Prevent accidental disruption of utility services to other facilities.

4. Limit disruption of utility services to hours the site is unoccupied.

F. Lighting Control Contractor Personnel:

1. All employees of the Lighting Control Contractor shall wear identification clearly indicating the Lighting Control Contractor's company name while on site.

2. All vehicles of the Lighting Control Contractor or employees shall be parked in areas designated by the Owner.

3. Do not install equipment in dusty conditions or allow dust to accumulate in or on installed Lighting Control Equipment.

4. Protect all work and equipment from damage by contractors, employees, and/or others.

5. Protect all existing work-in-place by others from damage by the Lighting Control Contractor. The Lighting Control Contractor will be solely responsible for any/all damage to work-in-place by others.

6. Keep areas around and inside of each piece of equipment and each rack free from dust, dirt, and debris throughout the project. Equipment that is not properly maintained during installation shall be replaced at no cost to the Owner before final payment is made to the Lighting Control Contractor.

7. All Lighting Control Contractor equipment and materials and all customer furnished equipment (CFE) and Owner Furnished, Contractor Installed (OFCI) turned over to the Lighting Control Contractor stored at the Lighting Control Contractor's facility(s) or stored and/or installed at the Project site will remain the property of the Lighting Control Contractor unless or until Ownership is legally transferred and accepted in writing by the Owner.

8. The Lighting Control Contractor shall be solely responsible for the protection of all equipment from damage, theft, or vandalism regardless of cause, until the work described herein is accepted by the Owner at the time of Final Checkout.

1.7 SCOPE OF WORK

A. The Lighting Control Contractor's work shall include labor and materials that consist of providing fabrication, installation, cable termination, continuity (copper) testing, documentation, and initial system power-up for a complete and fully functional system.

B. The Lighting Control Contractor shall furnish, as needed, and install all equipment and components of the system as detailed and specified in accompanying drawings and within the manufacturer's recommendations.

C. Installation of all incidental or related products or materials necessary to ensure a complete operating system.

D. All components are to be installed by a qualified Lighting contractor and/or Electrician.

E. Use of Touch Screens requires a CAT5e/6 run to the Control room and Stage.

F. Button Station in the Control room will be direct replacement.

G. Stage Button Station will require conduit stub out.

H. The new Wall Rack installation in the Dimmer Room will require demolition of existing Sensor+ Net Box.

I. Network cables must be preserved and re-routed into the new Wall Rack.

J. 120V Feed from existing Sensor+ Net Box will feed new Wall Rack.

K. The new Wall Rack closed depth is 17".

L. If any existing System Infrastructure (wiring, power, hardware not contained herein, etc.) is found to be non-functional, repair or replacement of said Infrastructure and all related costs will be the Owner.

M. All other components will be covered under ETC's standard 2 Year System Warranty.

N. Installation of all hardware or materials necessary to complete the work, including, but not limited to, mounting brackets, cabling, connectors, wire ties, tie bases, Panduit, wire ways, or conduit as necessary to provide a clean, neat, and professional installation.

O. Installation of all required seismic restraints following local building codes and regulations. This requirement includes but is not limited to the rack, and theater speakers.

P. Test connection and signal continuity of each cable of the system to ensure proper installation and operation.

Q. All test results shall be properly documented. Lighting Control Contractor shall, upon request, provide reports of all tests completed.

R. Coordination and collection of all manuals, supplied spare parts, shipping containers for major items, software, and warranty information & registration. Lighting Control Contractor will deliver these items at the completion of the project.

S. Lighting Control Contractor must capture and provide a list of all equipment serial numbers to the Owner for the Owner's tracking system.

T. The Scope of Work is inclusive of installation, continuity ("copper") testing, and related warranties/guaranties as described in this document.

1.8 SYSTEM DESCRIPTION

A. Dimmer Room: The Lighting Control system shall include a control processor, station power module, network switches, a wall-mounted rack, and a UPS.

B. Control Room: The Control Room shall have a seven-inch touchscreen and a five-button station that will replace the existing one.

C. Stage: The Stage shall have a seven-inch touchscreen with a locking cover and a five-button station that will replace the existing one.

1.9 SUBMITTALS

A. All submittals shall be in accordance with the general provisions of the contract including general and supplementary conditions and other specification sections.

B. Lighting Control Contractor shall submit shop drawings to the General Contractor for approval for any custom or fabricated items before procurement or installation.

C. Lighting Control Contractor shall submit shop drawings to the General Contractor for approval for all interconnect panels before procurement or installation.

D. Lighting Control Contractor shall submit testing documents to the General Contractor for cables installed.

1.10 COORDINATION OF RELATED WORK BY OTHERS

A. The Lighting Control Contractor shall coordinate with the General Contractor and other construction trades to ensure proper integration and operation of the Lighting Control system with the complete project designs, building systems, and all other elements of the project.

B. The Lighting Control Contractor shall coordinate with all involved to complete project Construction Documents to help facilitate effective coordination of the work with the work of other trades.

C. It shall be the responsibility of the Lighting Control Contractor to coordinate with all parties whose work impacts the Lighting Control Contractor’s work to ensure the complete coordination and successful implementation of the Lighting Control system. Related work by these identities shall include, but may not be limited to, the following:

1. Customer Furnished Equipment (CFE): All Lighting Control equipment will be procured by the Owner. (see list below) Customer Furnished Equipment (CFE) shall be provided by the Owner and supplied to the Lighting Control Contractor for connection, installation, and/or integration into the Lighting Control system as delineated in the manufacturer instructions. This shall include new or existing equipment provided by the Owner which would be considered OFCI – Owner furnished; Contractor installed.

2. The Lighting Control Contractor shall be responsible for coordinating with the Owner to ensure that any Customer Furnished Equipment is fully operational and compatible with other Lighting Control equipment and that it is made available to the Lighting Control Contractor in a timeframe that does not delay the Lighting Control Contractor’s work.

3. Information Technology Systems: Unless otherwise specified, all Lighting Control system networks and cabling are not a part of the site network system. The Lighting Control Contractor shall be responsible for coordinating with the Owner or the Owner's designated representative regarding any connections between the Lighting Control System and the site Owner's data network.

D. Electrical (AC) Power Service and Connections

1. Technical Power Service: All electrical panels, power receptacles, conduits, mounting hardware, and interconnecting wiring shall be supplied by the Lighting Control Contractor.

2. The Electrical Contractor shall extend AC power circuits and insulated ground wires into the equipment rack, as necessary. This work must be done by a qualified electrician, licensed in the jurisdiction of this project, and under the direction of the General Contractor.

E. Low Voltage Cable Containment

1. Low voltage cable containment, including raceways, conduits, and junction boxes, required to support Lighting Control system devices and interconnecting cabling shall be provided by the Lighting Control Contractor.

2. Upon commencement of work on the project the Lighting Control Contractor shall review the Construction Documents to confirm that the infrastructure provided is sufficient to accommodate the Lighting Control system to be installed. Any conflicts or issues must immediately be brought to the attention of the General Contractor, and the Owner.

3. All cabling for the project shall be neatly installed within cable pathways and the rack. Use of cable management including but not limited to Velcro brand or self-griping straps, lacing bars, and proper cable labeling.

a. Lighting Control Contractor shall clearly, logically, and permanently affix cable labels to each terminated end of each cable. The cable label shall include the wire number, source, and destination at a minimum. Example: EL204: DTP CP to DTP TX-07

b. P-Touch-style self-adhesive labeling shall be used on equipment to indicate the system name for each device. The cable label shall include the wire number, source, and destination on each end of the cable. The cable label shall be permanent with easy-to-read text.

c. All labels shall be affixed at 3 inches from each terminated cable end.

d. Brady or Tyton-type self-laminating cable labels shall be used at each terminated cable end. Labels shall have a write-on area of .5 inches high by 2 inches wide.

e. All Input/output (I/O) panels will be clearly labeled with permanent labeling identifying each source or destination.

F. Low Voltage Cabling and Termination

1. All network, control, and other low-voltage cabling associated with the Lighting Control system shall be provided, installed, and terminated by the Lighting Control Contractor utilizing the cable containment infrastructure (e.g. conduit, raceways, junction boxes, etc.).

2. The Lighting Control Contractor shall provide all patch cords and other cable assemblies required to connect Lighting Control equipment to network data outlets and any other required system or network inputs or outputs. Where cable installation is required, this will include wall jacks, plates, and terminations at all room devices, and service loops at each location shall be provided by the Lighting Control Contractor.

G. Equipment Mounting and Support

1. The Lighting Control Contractor shall coordinate with the General Contractor and other trades as necessary to ensure compatibility of the structural supports.

2. The Lighting Control Contractor shall install all Lighting Control Equipment, as indicated in this Specification and the Construction Documents. The Lighting Control Contractor shall verify location and structural suitability before attaching equipment and mounts. Any question of structural integrity shall be brought to the attention of the General Contractor.

H. Lighting Control System Connections to Building Systems and Controls

1. The Lighting Control Contractor shall coordinate with the General Contractor to verify that all devices and controls to be interconnected to the Lighting Control System are functioning properly before commencing interconnection to the Lighting Control equipment.

2. The Lighting Control Contractor shall investigate all hardware and software control conflicts between the building systems and the Lighting Control equipment before interconnecting the building systems. Report any conflicts, potential or existing, to the Architect and Owner, in writing, before interconnecting the systems. Damage caused to any base building systems due to the improper connection of Lighting Control equipment shall be the sole responsibility of the Lighting Control Contractor.

3. The Lighting Control Contractor shall select and install the appropriate cable type to facilitate device communication from the Lighting Control equipment to interconnected building systems.

4. The Lighting Control Contractor shall coordinate with the General Contractor to verify the proper operation of the connected Lighting Control equipment and the building systems after interconnecting the systems.

1.11 QUALIFICATIONS

A. Lighting Control System: Lighting Control Contractor shall provide a resume showing that they have been engaged in the supply and installation of professional Architectural Lighting Control systems and equipment for a minimum of five years detailing the Lighting Control Contractor’s expertise with these systems.

B. The Lighting Control contractor must be ETC authorized and certified for installation, programming, and commissioning purposes.

C. The Lighting Control contractor may utilize a local ETC-certified reseller like Illumination Concepts or equal to fulfill this requirement.

D. The Lighting Control Contractor shall include references and contact information from at least three similar projects with a project summary for each. The Lighting Control Contractor shall have and provide a copy of the California C-7 low voltage Contractor's license as well as any other applicable licensing or permits it holds.

E. The Lighting Control Contractor shall be able to provide the necessary professional design, engineering, fabrication, installation, and project management personnel to execute the work and to guarantee a complete, functional system in compliance with the intent of this specification.

F. The Lighting Control Contractor shall be licensed with all agencies having jurisdiction over the work.

G. The Lighting Control Contractor shall maintain permanent fabrication, service, and support facilities within (100) miles of the Project site.

H. The Lighting Control Contractor shall be an authorized ETC Service provider and Advanced Programmer to install, program, and commission the ETC equipment.

1.12 PROJECT COMMENCEMENT SUBMITTALS

A. Immediately upon award of the contract and authorization to proceed with the Work, the Lighting Control Contractor shall commence initial planning and coordination. Project Commencement Submittals required upon commencement of the Work shall include, but not be limited to, the following:

B. Project Plan

1. Provide a complete and detailed schedule for the Lighting Control Contractor's work describing the major tasks, sequence of work, submittals, and other critical milestones. At a minimum, the tasks noted in the schedule shall include all required submittals, rack assembly and shop testing, on-site cable installation, periodic shop, and site visits, on-site equipment installation, Substantial Completion, and Project Completion. Indicate the sequence of installation and completion by room and/or system. The Schedule shall also include anticipated dates of acquisition of major equipment and their installation milestones.

2. Provide a complete listing of the Lighting Control Contractor's project team, including the names and all contact information (email address, cell phone, etc.) for all personnel assigned to the Project. At a minimum, this Project Team Directory shall include the Lighting Control Contractor's executive in charge of the Project as well as the Project Manager, Lead Engineer, and Lead Installer. Include names and contact information for all subcontractors.

C. Listing of Long Lead Time Equipment

1. The Lighting Control Contractor shall submit a list of long-lead items including installation materials, wires, connectors, adapters, converters, etcetera. These are items that may be necessary to order ahead of the submittal and approval sequence to avoid adversely impacting the project schedule. Do not include equipment that will be ordered within the scheduled submittal and approval process.

2. The Lighting Control Contractor shall use reasonable judgment in determining which products are legitimate long-lead items. Failure to include an item that may require a long procurement lead time shall not relieve the Lighting Control Contractor of responsibility for furnishing the item to meet the agreed Schedule.

1.12 SUBMITTALS

A. Submit under provisions of Section 01 30 00.

B. Product Data:

1. Manufacturer's data sheets on each product to be used.
2. Preparation of instructions and recommendations.
3. Storage and handling requirements and recommendations.
4. Typical installation methods.

C. Shop Drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer for lighting control system: ETC, Inc., which is located at 3031 Pleasant View Rd., P. O. Box 620979; Middleton, WI 53562-0979; Phone: 608-831-4116; Email:mail@etcconnect.com; Web:www.etcconnect.com.

B. Equipment substitutions shall need to be pre-approved in writing by the Owner or its designated representative. The Lighting Control Contractor shall demonstrate that the substitute equipment shall operate in compliance with the functions and features specified herein and be able to integrate with the existing lighting system.

2.2 EQUIPMENT

A. Equipment list

Item #	Qty	Mfg.	Model	Description	Location
				LIGHTING	
				ETC Paradigm Architectural Control System Consisting of:	Dimmer Room Wall Rack

1	1	ETC	ERn2-RM	ERn2 Rack Mount Electronics Enclosure	Dimmer Room Wall Rack
2	1	ETC	P-ACP	Paradigm Architectural Control Processor	Dimmer Room Wall Rack
3	1	ETC	P-SPM-E	Paradigm Station Power Module	Dimmer Room Wall Rack
4	2	ETC	Ern-NET	ETC Configured Cisco 10 Port PoE Network Switches	Dimmer Room Wall Rack
5	1	ETC	P-TS7-E4 P-LCD-SLBB P-LCD-LC-4	Surface Mount Color 7" Touch Screen w/Locking Cover	Stage
6	1	ETC	P-TS7-PE-4 P-LCD-SBB	7” Color Desktop Portable Touch Screen	Control Room
7	1	ETC	UH10005- 51F	Paradigm Heritage 5 Button Station w/ Surface Mount Back Box — Black,	Control Room
8	1	ETC	UH11K05-51F	Paradigm Heritage 5 Button Station w/ Custom Cover Plate to replace old LCD Stage Location — Black	Stage
9	1	Middle Atlantic	DWR-12-17	Middle Atlantic DWR Hinged Data Rack — 12U / 17” Depth	Dimmer Room Wall Rack
10	1	CyberPower		1500VA Rack Mount Shallow Depth Sinewave UPS	Dimmer Room Wall Rack

2.3 ARCHITECTURAL CONTROLS - PARADIGM

A. Unison Control Series:

1. Product: Paradigm Architectural Control Processor by ETC, Inc.

a. Model P-ACP: Unison Paradigm Architectural Control Processor.

b. Standards Compliance: cULus Listed. CE Compliant.

c. Functional:

1) Capacity:

a) Channels of Control: 1,024.
b) Stations: 128.

2) System:

a) Net3 system interoperability including sACN.
b) Network Time Protocol for real-time clock synchronization supporting real and astronomical events.
c) Two physical DMX ports, each configurable as an input or output.
d) Configuration of DRd dimming operations.

e) 12 control processors per system.
   1) Addition of processors to a system proportionately increases the overall capacities.

3) Serial Input/Output:

   a) Eight-bit word length, parity selection and one or two stop bits.
   b) Fully customizable input and output messages.
   c) Bi-directional.

4) Configuration Data:

   a) Remote upload from a connected PC running LightDesigner or another connected Paradigm ACP.

   b) Stored in removable solid-state memory for easy transfer to another Paradigm ACP.

5) Local User Interface:

   a) Control functionality for control channels, zones, fixtures, groups, presets, macros, walls, and sequences.

   b) Ability to schedule timed events (add/edit/delete).

   c) Transfer of configuration using removable media.

   d) Transfer of configuration to and from touchscreen stations using removable media.

6) User Access Controls: Two user accounts: Administrator and User. Local to each processor.

7) Web User Interface:

   a) Internal web server accessible via Ethernet port.
   b) Activate and deactivate presets.
   c) Schedule timed events (add/edit/delete).
   d) Displays status information and log files.
   e) Configuration of processor settings.
   f) Supports configurable user login security options.

8) Diagnostics: Standard and Critical Event logging.

9) Stations:

   a) Connected to a Paradigm processor via topology-free LinkConnect, or star-topology NetConnect.

   b) Discovery and binding accomplished from the local user interface

or LightDesigner.

10) Operation:

a) Configurable DMX output refresh rate.
b) Support for 16-bit DMX attributes.
c) User configurable arbitration for multiple internal and external source data.

d. Mechanical:

1) For use in Unison DRd Rack Enclosure Series and Unison ERn Control Enclosure Series.

2) Microprocessor-based, solid-state technology provides multi-scene lighting and building controls.

3) Fully contained plug-in module with no discrete wire connections.

4) Tool-free installation.

5) Front-panel user interface with backlit LCD and alphanumeric button panel.

6) RJ-45 Ethernet, Secure Digital (SD) and Universal Serial Bus (USB) media on front panel.

e. Electrical:

1) No discrete wiring connections required for use in a dimming or control enclosure.

2) Echelon LinkPower communications with remote devices, including button stations, button/fader stations, touchscreen stations, sensors, and third party LonMARK compliant products.

3) Hot swappable.

4) System configuration and programming stored in flash memory.

5) Support of ESTA BSR E1.17 Advanced Control Networks (ACN) and ESTA BSR E1.31 (sACN) Protocols.

6) EIA-RS232 serial protocol for bi-directional command and communication with third-party equipment.

7) Two discrete ESTA DMX512A ports, configurable as input or output ports.

8) User Datagram Protocol (UDP) messaging input and output for control of Paradigm or external systems.

9) Four dry-contact closure inputs.

10) Four contact-closure outputs rated 1 A at 30 VDC.

f. Operating Temperature Range: 32-104 degrees F (0-40 degrees C).

g. Relevant Humidity Non-Condensing: 10 to 90 percent.

2. Product: Unison Paradigm Station Power Module Mk2 by ETC, Inc. For use with Unison DRd and ERn enclosures with Paradigm control. Addition of Station Power Module offers support for button, fader, and touchscreen stations.

a. Model P-SPM-E: Unison Paradigm Station Power Module Mk2.

b. Standards Compliance: cULus Listed. CE Compliant.

c. Functional:

1) Provides Echelon LonTalk with LinkPower for up to 63 stations.
2) Provides 24 V auxiliary power for interface and touchscreen stations.
3) Provides 1,640 ft (500 m) of station bus from the ERn or DRd enclosure.

d. Mechanical:

1) Designed for use in Unison Dimming (DRd) and Control (ERn) Series Enclosures.
2) 18-gauge formed steel construction.
3) Fine-textured, scratch-resistant, epoxy paint.
4) Wall-mount and rack-mount variants available.
5) Convection cooled.
6) Fully contained plug-in module with no discrete wire connections.
7) Tool-free installation.
8) Front-panel status indicators.

e. Electrical:

1) No discrete wiring connections are required for use in a DRd dimming or ERn control enclosure.

2) Echelon LinkPower communications with remote devices, including button stations, button/fader stations, touchscreen stations, sensors, and third-party LonMARK-compliant products.

3) 24 V Auxiliary power for interface and touchscreen stations.

f. Operating Temperature Range: 32 to 104 degrees F (0 to 50 degrees C).

g. Relevant Humidity Non-Condensing: 10 to 90 percent.

3. Product: Unison ERn External Control Enclosure by ETC, Inc.

a. Model ERn2-RM Single Processor Control Enclosure-Rack Mount.

b. Standards Compliance: cULus Listed, CE Compliant.

c. General:

1) External Processing Enclosure designed for one or two control processors plus options and accessories.

2) Full 2-year Warranty.

d. Mechanical:

1) 18-gauge formed steel construction.
2) Fine-texture, scratch-resistant epoxy paint.
3) Wall-mount and 19 in rack-mount variants.
4) Rack-mount enclosure sizes: ERn2: 5U and ERn4: 8U.
5) Rack mount offers connectorized rear panel for all wiring connections.
6) Convection-cooled.
7) Hinged, Locking door with limited access to control processor. Integral electrostatic air filter.
8) Tool-free module removal and installation.
9) 19 in equipment-rack mount offers connectorized rear panel for all wiring connections.
10) Wall-mount offers front access wiring terminations.
11) Top, bottom, and side knockouts for conduit entry.

e. Electrical:

1) External control enclosure rated for 100 V, 120 V, 230 V CE or 240 V UL single phase configurations, 3.5 A maximum draw at 120 V.

a) AC (single phase).
b) 24 VDC (2-16 AWG).
c) LinkConnect.
d) Two configurable DMX512A ports.
e) RS232 Bi-directional serial.
f) Cat5/5e UTP Ethernet.
g) Contact I/O, 4in/4out (14 to 26 AWG).
1) Contact output rated 1 A at 30 VDC.

2) Contractor-supplied input and control wiring.

3) Factory-provided connectors for wiring terminations.

f. Operating Temperature Range: 32 to 104 degrees F (0 to 50 degrees C).

g. Relevant Humidity Non-Condensing: 10 to 90 percent.

h. Optional Modules:

1) Ethernet Switch (ERn-NET):

a) Five-port Ethernet switch with four ports supplying Power over Ethernet (PoE).
b) 100BaseTX 802.3af PSE compliant.
c) For use in wall-mount ERn only.
d) Not compatible with ERn4-W-S.

B. Unison Heritage Control Series:

1. Product: Unison Heritage Button Station by ETC, Inc.

a. Model UH10005: 1-gang, 5-button.
b. Model UH11K05: 1-gang, 1-keyswitch (maintained), 5-button.
c. Standards Compliance: cULus Listed. CE Compliant.
d. Mounting: Flush, Surface.

e. Functional:

1) Button and key switch functions: preset selection, record mode activation, station lockout, raise, lower, macro activation, zone on/off control, timed-event override, and wall open/close or toggle.

2) Custom button functionality programmable via LightDesigner configuration software.

3) Programmable electronic lockout levels.

4) Allows for programming of individual lockout levels.

f. Mechanical:

1) Gangable for custom applications.
2) Enclosed electronics assembly and faceplate included.
3) Cantilevered switch arrays with removable caps.
4) No visible means of attachment.
5) Flush-mount in industry-standard back box, RACO 690 or equivalent.
6) Surface-mount backboxes available from the manufacturer.
7) Constructed of injection-molded, ABS plastic.
8) Indelibly marked legends in contrasting colors.
9) Integral RGB LED response indicator for each button.
10) Integrated IR receiver.
11) Unison Heritage Locking Cover.

g. Electrical:

1) Connect via Echelon LinkPower control network utilizing low-voltage Class II wiring.

2) Topology-free and polarity-independent wiring over Belden 8471 and one No. 14 ESD drain wire.

a) Wiring may be bus, loop, home run, or any combination of these.

3) All station terminations are connectorized.

h. Operating temperature Range: 32 to 104 degrees F(0 to 40 degrees C).

i. Relative Humidity, Non-Condensing: 30 to 90 percent.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly constructed and prepared.

B. If substrate preparation is the responsibility of another installer, notify the Architect in writing of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer to achieve the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.

3.4 FIELD QUALITY CONTROL

A. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

B. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.

3.5 CLEANING AND PROTECTION

A. Clean products in accordance with the manufacturer's recommendations.

B. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 FINAL ACCEPTANCE SUBMITTALS

A. Prior to Final Acceptance the Lighting Control Contractor shall submit the following:

1. Hardcopy Project Record Documents

a. Product Information Binders which shall consist of all product literature, manuals, software, and other material provided by equipment manufacturers with the Lighting Control Equipment. Material shall be assembled in the binders with section dividers and a table of contents.

b. Warranty documentation including warranty start and end dates for each piece of equipment provided.

c. Explanation of procedures for obtaining telephone support and on-site service during the Lighting Control Contractor's warranty period.

d. Final Equipment List with itemized listing by room/system, including serial number for each item.

e. Printed continuity test results.

f. One (1) half-size set of all Lighting Control System design drawings revised to reflect "as-built" conditions.

g. One (1) full-size set of all Lighting Control System design drawings revised to reflect "as-built" conditions.

2. Electronic documentation on CD-ROM(s) to include:

a. All specific device application software.

b. Final equipment list with warranty and serial number information.

c. As-builts Drawings in PDF format.

d. As-builts Drawings in .DWG format.

3.7 WARRANTY & MAINTENANCE SUPPORT

A. Basic Warranty

a. Basic Warranty provided by the Lighting Control Contractor shall include repair or replacement for one (1) year from Final Acceptance on all Lighting Control equipment provided (including products having a manufacturer's warranty of less than one year) and all Lighting Control Contractor workmanship. Basic Warranty shall be provided at no additional cost, except in case of obvious abuse. Consumable items such as lamps, batteries, etc. are not covered by Basic Warranty. Manufacturers' warranties on Lighting Control equipment of more than one year shall remain in force beyond the Lighting Control Contractor's basic warranty period.

b. During the Basic Warranty period the Lighting Control Contractor shall:

1) Provide telephone support within 4 hours of a call requesting service.

2) Provide on-site support within 24 hours of a call requesting service not corrected by telephone support.

3) Repair or replace faulty items within 72 hours of on-site service or within the manufacturers' specific repair program whichever is quicker.

4) Lighting Control Contractor shall not involve the Owner with removing, re-installing equipment, shipping, or receiving equipment being repaired under Basic Warranty, nor shall the Owner be responsible for any shipping or freight charges associated with any item under warranty.

5) The General Contractor and the Owner shall be copied with all paperwork related to all warranty work during the Basic Warranty period.

6) The Basic Warranty period will commence no sooner than the date of first beneficial use by the Owner and no later than the date of contract closeout.

END OF SECTION

PART 1 GENERAL

1.1 PROJECT

A. Project Name: Theater Modernization – Audio/Video

B. Project Location: Mission Vista High School, 1306 Melrose Dr, Oceanside, CA 92057

C. Owner: Vista Unified School District

D. Audio/Video Designer: PAC Engineering

E. The Vista Unified School District is requesting bids for Theater - Audio/Video Modernization installation utilizing the enclosed plans, specifications, and additional information included in this bid packet. The Theater audio/video modernization includes both hardwired and wireless microphones, an RF antenna system, an audio mixer with associated integrated audio equipment, a rack, speakers, monitoring systems, and an integrated distribution system.

F. The Project consists of the interior modernization of the Mission Vista High School Theater – control room, projector catwalk, audience seating area, upstage, and backstage, as well as the Theater lobby area, the Drama Tech classroom, and the Drama classroom. Modernization includes but is not limited to the installation of electrical, conduits, lighting, and audio, video, and data cabling as required per drawings/plans.

G. The Manufacturers included in the A/V design are the following but not limited to Extron, Behringer, Audio Technica, QSC and LG,

H. The Audio/Video Contractor needs to be an authorized Extron reseller in order to install, program, and commission the Extron equipment.

I. All Extron programming and GUI interfaces must be approved by the Owner.

J. Section 27 41 00 of the Audio/ Video specification describes the logical design, installation, wiring, interfaces, locations, hardware/software, testing, and documentation of the integrated Audio/Video System. Failure to read/follow the information in this section along with the drawings/plans may result in an inaccurate bid and installation of the project.

K. This specification specifies installation standards, practices, and guidelines.

L. It is the Audio/Video Contractor’s responsibility to propose, acquire, and provide all items required for a complete operational system.

1.2 DEFINITIONS

A. C.B.C.: California Building Code.

B. C.C.R.: California Code of Regulations.

C. Furnish: To supply products to the project site, including delivery.

D. Install: To put products in place to be work-ready for the intended use, including unloading, unpacking, handling, storing, assembling, installing, erecting, placing, applying, anchoring, working, finishing, curing, protecting, cleaning, and similar operations.

E. Provide: To furnish and install products, equipment, and materials.

F. Indicated: Shown, noted, scheduled, specified, or drawn, somewhere in the Contract Documents.

G. Audio/Video Contractor: Qualified low voltage contractor/installer must have at least 5 years of experience installing audio/video systems.

H. Owner or Client: shall refer to Vista Unified School District or their designated representative.

I. District: Vista Unified School District.

J. OFCI: Owner Furnished, Contractor installed.

K. Manufacturer: shall refer to the original manufacturer of any equipment provided as part of the work.

L. CFE: Client Furnished Equipment.

M. EE: Existing Equipment

1.3 REGULATORY REQUIREMENTS

A. The Audio/Video Contractor shall obtain any permits and shall pay all fees required by public agencies having jurisdiction over the work.

B. All products and materials provided shall be listed by the Underwriters Laboratory (UL) and shall bear the UL label intended for the purpose specified and indicated. If UL has no published standards for a particular item, then other national independent testing standards shall apply, and such items shall bear those labels.

C. The Audio/Video Contractor and their employees shall perform all work in compliance with current Occupational Safety and Health Administration (OSHA) guidelines and regulations and other safety and health requirements as may be mandated by the Owner, the Architect. or other authorities.

D. The Audio/Video Contractor shall have a thorough knowledge of governing codes and standards in effect and have jurisdiction over the Project. Lack of awareness of any of the relevant codes and standards will not be accepted as a reason for non-compliance.

E. The Audio/Video Contractor shall be responsible for providing cable and materials that comply with applicable codes and requirements of regulating bodies. The cost for these materials shall be included in the Bid price, as the Owner shall not accept change orders for changes in materials.

F. The following regulations apply to this project:

1. 2022 California Building Code, Title 24, Part 2, California Code of Regulations (C.C.R.).

2. 2022 California Electrical Code, Title 24, Part 3, California Code of Regulations (C.C.R.).

3. 2022 California Mechanical Code, Title 24, Part 4, California Code of Regulations (C.C.R.).

4. 2022 California Plumbing Code, Title 24, Part 5, California Code of Regulations (C.C.R.).

5. 2022 California Fire Code, Title 24, Part 9, California Code of Regulations (C.C.R.).

6. ANSI/EIA/TIA 568 E: Commercial Building Telecommunications Wiring Standard, current edition.

7. ANSI/EIA/TIA 569 E: Commercial Building Standard for Telecommunications Pathways and Spaces, current edition.

8. ANSI/EIA/TIA 607 C: Commercial Building Grounding and Bonding Requirements for Telecommunications, current edition.

9. ANSI/EIA 310-D: Equipment Racks and Panels, current edition.

1.4 CONTRACT DESCRIPTION

A. Contract Type: A single contract based on a stipulated price.

1.5 OWNER OCCUPANCY

A. Owner intends to occupy the project space upon substantial completion.

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

C. Schedule the work to accommodate Owner occupancy.

1.6 AUDIO/VIDEO CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on drawings/plans.

B. Arrange use of site and premises to allow:

1. Owner occupancy.

2. Work by others.

3. Work by Owner.

C. Provide access to and from the site as required by law and by the Owner:

1. Emergency Building Exits During Construction: Keep all exits required by code open during the construction period; provide temporary exit signs if exit routes are temporarily altered.

2. Do not obstruct roadways, sidewalks, or other public ways without a permit.

D. Time Restrictions:

1. Limit conduct of especially noisy exterior work to the hours regulated by the local jurisdiction.

E. Utility Outages and Shutdown:

1. Limit disruption of utility services to hours the site is unoccupied.

2. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm systems, without 48-hour notice to the Owner and authorities having jurisdiction.

3. Prevent accidental disruption of utility services to other facilities.

4. Limit disruption of utility services to hours the site is unoccupied.

F. Audio/Video Contractor Personnel:

1. All employees of the Audio/Video Contractor shall wear identification clearly indicating the Audio/Video Contractor’s company name while on site.

2. All vehicles of the Audio/Video Contractor or employees shall be parked in areas designated by the Owner.

3. Do not install equipment in dusty conditions or allow dust to accumulate in or on installed Audio/Video Equipment.

4. Protect all work and equipment from damage by contractors, employees, and/or others.

5. Protect all existing work-in-place by others from damage by the Audio/Video Contractor. The Audio/Video Contractor will be solely responsible for any/all damage to work-in-place by others.

6. Keep areas around and inside of each piece of equipment and each rack free from dust, dirt, and debris throughout the project. Equipment that is not properly maintained during installation shall be replaced at no cost to the Owner before final payment is made to the Audio/Video Contractor.

7. All Audio/Video Contractor equipment and materials and all customer furnished equipment (CFE) and Owner Furnished, Contractor Installed (OFCI) turned over to the Audio/Video Contractor stored at the Audio/Video Contractor's facility(s) or stored and/or installed at the Project site will remain the property of the Audio/Video Contractor unless or until Ownership is legally transferred and accepted in writing by the Owner.

8. The Audio/Video Contractor shall be solely responsible for the protection of all equipment from damage, theft, or vandalism regardless of cause, until the work described herein is accepted by the Owner at the time of Final Checkout.

1.7 SCOPE OF WORK

A. The Audio/Video contractor's work shall include labor and materials that consist of providing fabrication, installation, cable termination, continuity (copper) testing, documentation, and initial system power-up for a complete and fully functional system.

B. The Audio/Video Contractor shall furnish, as needed, and install all equipment and components of the system as detailed and specified in accompanying drawings and within the manufacturer's recommendations.

C. The Audio/Video Contractor shall perform the initial power-up of the system.

D. Installation of all incidental or related products or materials necessary to ensure a complete operating system.

E. The Audio/Video Contractor shall demo the existing rack located backstage. The following equipment and any associated cabling will remain per installation drawing/plans: Middle Atlantic- Power Center, Blank panels, Listen- Assistive Listening system, and HP- Network switch.

F. The Audio/Video Contractor shall mount multiple Video Monitors within the Theater modernization. The areas include the Theater Control Room, the Theater Lobby, the Drama Classroom, and the Drama Tech Classroom.

G. The Audio/Video Contractor shall install Electrical outlets behind each of the video monitors.

H. The existing Theater projector located in the catwalk area will need to be relocated by the Audio/Video Contractor. The projector will be mounted approximately (6) six feet below the pony wall. All cables and wires may need to be rerun to the new location and is the responsibility of the Audio/Video Contractor to provide it. The Audio/Video Contractor shall coordinate with the owner and the General Contractor for the exact location.

I. The Audio/Video contractor shall provide an I-O panel for both the control room and Theater audience seating area. The Audio/Video Contractor shall coordinate with the Owner and the General Contractor for the exact location.

J. The Audio/Video Contractor shall install a Point of View (POV) camera in the back of the theater audience area, just below the projector. The field of view (FOV) should be a wide shot of the stage.

K. Installation of all hardware or materials necessary to complete the work, including, but not limited to, mounting brackets, cabling, connectors, wire ties, tie bases, Panduit, wire ways, or conduit as necessary to provide a clean, neat, and professional installation.

L. Installation of all required seismic restraints following local building codes and regulations. This requirement includes but is not limited to the rack, and theater speakers.

M. Test connection and signal continuity of each cable of the system to ensure proper installation and operation.

N. All test results shall be properly documented. Audio/Video Contractor shall, upon request, provide reports of all tests completed.

O. Coordination and collection of all manuals, supplied spare parts, shipping containers for major items, software, and warranty information & registration. Audio/Video Contractor will deliver these items at the completion of the project.

P. Audio/Video Contractor must capture and provide a list of all equipment serial numbers to the Owner for the Owner’s tracking system.

Q. The Scope of Work is inclusive of installation, continuity (“copper”) testing, and related warranties/guaranties as described in this document.

R. Final system testing, commissioning, setup, and training are NOT included in this Scope of Work and will be performed by others.

1.8 SYSTEM DESCRIPTION

A. Theater: The audio/video system will include (26) twenty-six wireless microphones and receivers, an RF antenna distribution system, (6) six theater speakers, a subwoofer, and a POV (Point of view) camera. The existing projector will be relocated (6) six feet below the top of the pony wall. There will be interconnecting panels and cable paths from the classrooms, control room, and the rack.

B. Stage Floor Pockets: There are (3) three existing floor pockets in the stage. Each pocket will have a new I-O panel in it. The I-O panel will have (2) two network ports, (2) two mic/line XLR connections, and (2) two line-out XLR connections.

C. Control Room: The control room shall have a new 40-channel input audio mixer with a 43" video monitor, speaker, and volume control. The new wireless microphone transmitters (belt packs and microphones) will be housed in the control room as well as (16) a sixteen-person wireless intercom system. Also included is an Apple iPad that will be used to interface with the audio mixer. There will be interconnect panels and cable paths from the control room to the rack in the classroom.

D. Guest User Station: This station will be able to control the projector/screen and adjust audio volume and turn on (2) two preassigned wireless microphones. The station will also include the ability for a guest to plug in their laptop and project it via the existing projector.

E. Rack: The existing rack will be demoed, and the following equipment and cabling will be saved and used with the new rack:

1. Middle Atlantic- Power Center
2. Listen- Assistive Listening System
3. HP- Network Switch

A new rack shall be added to the backstage. The rack shall house most of the equipment used in the theater and control room, which will include an audio and video routing system, audio monitoring, wireless microphone receivers, amplifiers, an access point, network switches, stage boxes, and the antenna distribution system. There will be a rack-mounted UPS (Uninterrupted Power Supply) in the rack powering all mission-critical devices.

F. Drama Tech Classroom: A video monitor on a roll-around device, (2) two speakers and wall-mounted volume control will be installed in this classroom. This will be used to monitor stage activities. Coordination will need to be made with the client for exact placement.

G. Drama Classroom: A video monitor, speaker, and wall-mounted volume control will be installed in this classroom. This will be used to monitor stage activities. Coordination will need to be made with the client for exact placement.

H. Theater Lobby: Two video monitors, speakers, and wall-mounted volume control will be installed in the lobby. This will be used to monitor stage activities. Coordination will need to be made with the client for exact placement.

1.9 SUBMITTALS

A. All submittals shall be in accordance with the general provisions of the contract including general and supplementary conditions and other specification sections.

B. Audio/Video Contractor shall submit shop drawings to the audio/video designer for approval for any custom or fabricated items before procurement or installation.

C. Audio/Video Contractor shall submit shop drawings to the audio/video designer for approval for all interconnect panels before procurement or installation.

D. Audio/Video Contractor shall submit testing documents to the audio/video designer for cables installed.

1.10 COORDINATION OF RELATED WORK BY OTHERS

A. The Audio/Video Contractor shall coordinate with the General Contractor and other construction trades to ensure proper integration and operation of the Audio/Video system with the complete project designs, building systems, and all other elements of the project.

B. The Audio/Video Contractor shall coordinate with all involved to complete project Construction Documents to help facilitate effective coordination of the work with the work of other trades.

C. It shall be the responsibility of the Audio/Video Contractor to coordinate with all parties whose work impacts the Audio/Video Contractor's work to ensure the complete coordination and successful implementation of the Audio/Video System. Related work by these identities shall include, but may not be limited to, the following:

1. Customer Furnished Equipment (CFE): Some equipment that will become a part of or connect to the Audio/Video System may be provided by the Owner and shall be designated as Customer Furnished Equipment (CFE). Customer Furnished Equipment shall be provided by the Owner and supplied to the Audio/Video Contractor for connection, installation, and/or integration into the Audio/Video System as delineated in the Audio/Video System design drawings and this specification. This shall include new or existing equipment provided by the Owner which would be considered OFCI – Owner furnished; Contractor installed.

2. The Audio/Video Contractor shall be responsible for coordinating with the Owner to ensure that all Customer Furnished Equipment is fully operational and compatible with other Audio/Video Equipment and that it is made available to the Audio/Video Contractor in a timeframe that does not delay the Audio/Video Contractor's work.

3. Information Technology Systems: Unless otherwise specified, all data networking cabling and active electronics not a part of the Audio/Video System shall be provided by others. The Audio/Video Contractor shall be responsible for coordinating with the Owner or the Owner's designated representative regarding connections between the Audio/Video System and the Owner's data network.

D. Electrical (AC) Power Service and Connections

1. Technical Power Service: All electrical panels, power receptacles, lighting fixtures, dimmers, lighting controls, and interconnecting wiring shall be supplied by Electrical Contractor.

2. The Electrical Contractor shall extend AC power circuits and insulated ground wires into each equipment rack. This work must be done by a qualified electrician, licensed in the jurisdiction of this project, and under the direction of the General Contractor.

E. Low Voltage Cable Containment

1. Low voltage cable containment, including raceways, conduits, and junction boxes, required to support Audio/Video System devices and interconnecting cabling shall be provided by the Audio/Video Contractor.

2. Upon commencement of work on the project the Audio/Video Contractor shall review the Construction Documents to confirm that the infrastructure provided is sufficient to accommodate the Audio/Video System to be installed. Any conflicts or issues must immediately be brought to the attention of the General Contractor, and the Owner.

3. All cabling for the project shall be neatly installed within cable pathways and the rack. Use of cable management including but not limited to Velcro brand or self-griping straps, lacing bars, and proper cable labeling.

   a. Cable label shall include wire number, source, and destination on each end of the cable. For more information on labeling refer to G-100, Installation – Identification systems in the drawing/plan package and section 3.3 – C. Installation, 2. Identification Systems – a of this specification.

F. Low Voltage Cabling and Termination

1. All audio, video, control, and other low-voltage cabling associated with the Audio/Video System shall be provided, installed, and terminated by the Audio/Video Contractor utilizing the cable containment infrastructure (e.g. conduit, raceways, junction boxes, etc.) provided by Audio/Video Contractor as noted on the Construction Documents.

2. The Audio/Video Contractor shall provide all patch cords and other cable assemblies required to connect Audio/Video Equipment to data outlets and any other required system or network inputs or outputs.

3. Where cable installation is required, this will include wall jacks, plates, and terminations at all room devices, and service loops at each location shall be provided by the Audio/Video Contractor.

G. Equipment Mounting and Support

1. Structural support for ceiling-mounted speakers, wall-mounted monitors, and other Audio/Video equipment shall be provided to the General Contractor as noted and

detailed in the Construction Documents. The Audio/Video Contractor shall coordinate with the General Contractor and other trades as necessary to ensure compatibility of the structural supports provided by the General Contractor with the Audio/Video equipment provided by the Audio/Video Contractor.

2. The Audio/Video Contractor shall install all Audio/Video Equipment, including display mounts, as indicated in this Specification and the Construction Documents. The Audio/Video Contractor shall verify location and structural suitability before attaching equipment and mounts. Any variations from the drawings and specifications or any question of structural integrity shall be brought to the attention of the General Contractor, and A/V designer before installing the equipment.

H. Audio/Video System Connections to Building Systems and Controls

1. Building systems and controls provided by the General Contractor or Owner that may be interconnected to the Audio/Video System shall include environmental controls, fire and life safety. Where required, the interconnection between these systems and the Audio/Video System is designated in these Specifications and the Construction Documents, including requirements for low-voltage interface electronics. The Audio/Video Contractor shall verify that all required system components and interfaces are specified and provided to enable the functional performance described in this Specification.

2. The Audio/Video Contractor shall coordinate with the General Contractor to verify that all devices and controls to be interconnected to the Audio/Video System are functioning properly before commencing interconnection to the Audio/Video Equipment.

3. The Audio/Video Contractor shall investigate all hardware and software control conflicts between the building systems and the Audio/Video equipment before interconnecting the building systems. Report any conflicts, potential or existing, to the Architect and Owner, in writing, before interconnecting the systems. Damage caused to any base building systems due to the improper connection of Audio/Video equipment shall be the sole responsibility of the Audio/Video Contractor.

4. The Audio/Video Contractor shall select and install the appropriate cable type to facilitate device communication from the Audio/Video equipment to interconnected building systems.

5. The Audio/Video Contractor shall coordinate with the General Contractor to verify the proper operation of the connected Audio/Video equipment and the building systems after interconnecting the systems.

1.11 QUALIFICATIONS

A. Audio/Video System: Audio/Video Contractor shall provide a resume showing that they have been engaged in the supply and installation of professional video and sound systems and

equipment for a minimum of five years detailing the Audio/Video Contractor's expertise with these systems. Audio/Video Contractor shall include references and contact information from at least three similar projects with a project summary for each. Audio/Video Contractor shall have and provide a copy of the California C-7 low voltage Audio/Video Contractor's license as well as any other applicable licensing or permits it holds.

B. The Audio/Video Contractor shall be able to provide the necessary professional design, engineering, fabrication, installation, and project management personnel to execute the work and to guarantee a complete, functional system in compliance with the intent of this specification.

C. The Audio/Video Contractor shall be licensed with all agencies having jurisdiction over the work.

D. The Audio/Video Contractor shall maintain permanent fabrication, service and support facilities within (100) miles of the Project site.

E. The Audio/Video Contractor shall be an Extron-authorized reseller.

1.12 PROJECT COMMENCEMENT SUBMITTALS

A. Immediately upon award of the contract and authorization to proceed with the Work, the Audio/Video Contractor shall commence initial planning and coordination. Project Commencement Submittals required upon commencement of the Work shall include, but not be limited to, the following:

B. Project Plan

1. Provide a complete and detailed Schedule for the Audio/Video Contractor's work describing the major tasks, sequence of work, submittals, and other critical milestones. At a minimum, the tasks noted in the Schedule shall include all required submittals, rack assembly and shop testing, on-site cable installation, periodic shop and site visits, on-site equipment installation, Substantial Completion, and Project Completion. Indicate the sequence of installation and completion by room and/or system. The Schedule shall also include anticipated dates of acquisition of major equipment and their installation milestones.

2. Provide a complete listing of the Audio/Video Contractor's project team, including the names and all contact information (email address, cell phone, etc.) for all personnel assigned to the Project. At a minimum this Project Team Directory shall include the Audio/Video Contractor's executive in charge of the Project as well as the Project Manager, Lead Engineer and Lead Installer. Include names and contact information for all subcontractors.

C. Listing of Long Lead Time Equipment

1. The Audio/Video Contractor shall submit a list of long-lead items including installation materials, wires, connectors, adapters, converters, etcetera. These are items that may be

necessary to order ahead of the submittal and approval sequence to avoid adversely impacting the project schedule. Do not include equipment that will be ordered within the scheduled submittal and approval process.

2. The Audio/Video Contractor shall use reasonable judgment in determining which products are legitimate long-lead items. Failure to include an item that may require a long procurement lead time shall not relieve the Audio/Video Contractor of responsibility for furnishing the item to meet the agreed Schedule.

1.13 FINAL ACCEPTANCE SUBMITTALS

A. Prior to Final Acceptance the Audio/Video Contractor shall submit the following:

1. Hardcopy Project Record Documents

a. Product Information Binders which shall consist of all product literature, manuals, software, and other material provided by equipment manufacturers with the Audio/Video Equipment. Material shall be assembled in the binders with section dividers and a table of contents.

b. Warranty documentation including warranty start and end dates for each piece of equipment provided.

c. Explanation of procedures for obtaining telephone support and on-site service during the Audio/Video Contractor’s warranty period.

d. Final Equipment List with itemized listing by room/system, including serial number for each item.

e. Printed continuity test results.

f. One (1) half-size set of all Audio/Video System design drawings revised to reflect “as-built” conditions.

g. One (1) full-size set of all Audio/Video System design drawings revised to reflect “as-built” conditions.

2. Electronic documentation on CD-ROM(s) to include:

a. All specific device application software.

b. Final equipment list with warranty and serial number information.

c. As-builts Drawings in PDF format.

d. As-builts Drawings in .DWG format.

1.14 WARRANTY & MAINTENANCE SUPPORT

A. Basic Warranty

1. Basic Warranty provided by the Audio/Video Contractor shall include repair or replacement for one (1) year from Final Acceptance on all Audio/Video Equipment provided (including products having a manufacturer's warranty of less than one year) and all Audio/Video Contractor workmanship. Basic Warranty shall be provided at no additional cost, except in case of obvious abuse. Consumable items such as lamps, batteries, etc. are not covered by Basic Warranty. Manufacturers' warranties on Audio/Video Equipment of more than one year shall remain in force beyond the Audio/Video Contractor's Basic Warranty period.

2. During the Basic Warranty period the Audio/Video Contractor shall:

   a. Provide telephone support within 4 hours of a call requesting service.

   b. Provide on-site support within 24 hours of a call requesting service not corrected by telephone support.

   c. Repair or replace faulty items within 72 hours of on-site service or within the manufacturers' specific repair program whichever is quicker.

   d. Audio/Video Contractor shall not involve the Owner with removing, re-installing equipment, shipping, or receiving equipment being repaired under Basic Warranty, nor shall the Owner be responsible for any shipping or freight charges associated with any item under warranty.

   e. A/V Designer and the Owner shall be copied with all paperwork related to all warranty work during the Basic Warranty period.

   f. The Basic Warranty period will commence no sooner than the date of first beneficial use by the Owner and no later than the date of contract closeout.

PART 2 - PRODUCTS

2.1 GENERAL

A. Acceptable products are listed below. Quantities are listed in this document; the Audio/Video Contractor shall also refer to the system drawings and provide quantities as necessary to deliver the specified functionality.

B. All products shall be new and under the manufacturer's warranty at the time of installation. B-stock, previously installed, refurbished, or used equipment shall not be installed on this project.

C. The Audio/Video Contractor shall provide all options, accessories, and hardware necessary to meet the functionality of the design even if all components are not specifically listed (i.e. rack mount kits, separate or additional power supplies, input modules, transformers, special or longer power cords, AV adapters or break-out cables, etc.).

D. The Audio/Video Contractor shall provide proper placement for the CFE projector screen and projector per manufacturer specifications. This includes ensuring the proper lens is installed to provide a properly sized and focused picture on the screen.

E. The Audio/Video Contractor shall coordinate with the designated sub-contractors or suppliers as required to ensure that all control panels, connector panels and other Audio/Video Equipment to be provided by the Owner

F. The Audio/Video Contractor shall provide all cabling necessary to connect wall and rack-mounted equipment and interfaces to Customer Furnished equipment (CFE) as specified in this document including extension patch cords for integrated network pass-through adapters.

G. The Audio/Video Contractor shall be responsible for providing all miscellaneous material required to provide a complete integration of all equipment into the Audio/Video. To provide clear and simple user connection of computers to the Audio/Video system, the Audio/Video Contractor shall observe the following requirements:

1. The Audio/Video Contractor shall securely attach any applicable interface electronics in a position that provides easy access for the connection of signal cables as well as adjustments and service of the electronics by system maintenance personnel. No loose equipment will be accepted unless specifically directed otherwise.

2. All video connections at the end user positions shall utilize signal connections per design.

3. Provide any required extension patch cords for integrated network pass-through adapters on computer workstation interfaces or connector panels.

4. Clearly label all connection points and cables with wire number, source, and destination information on it.

5. All power and signal cables shall be neatly routed and dressed in removable tie straps (e.g., Velcro) or other means for securing loose cables when not connected or not in use.

H. Model numbers listed are believed to be current and correct as of the preparation of this Section. All equipment shall be current models as of the time of installation.

I. Should listed models become obsolete, they shall be replaced with the manufacturers' direct or recommended replacement. Audio/Video Contractor shall submit a request for information (RFI) for written approval from the Owner or its designated representative prior to purchase.

2.2 EQUIPMENT

A. To establish a standard of quality as required by the Owner, various Manufacturers' equipment must meet the requirements in this section. This is a highly integrated system and as such each equipment item must meet the technical and functional requirements of the system.

B. The Owner or its designated representative shall establish equivalency and compliance of the product or components offered for use.

C. Equipment substitutions shall need to be pre-approved in writing by the Owner or its designated representative. The Audio/Video Contractor shall demonstrate that the substitute equipment shall operate in compliance with the functions and features specified herein.

D. Equipment List:

Item #	Qty	Mfg.	Model	Description	Location
				Audio	
1	1	Behringer	X32	40-input, 25-total-bus Digital Mixer with 32 Gain-Programmable Mic Preamps, 25 Motorized Faders, Virtual FX Rack, and 7" Color TFT	Control Room
2	1	Behringer	S32	32-channel Digital Snake with Remote-controllable Midas-designed Mic Pres, an AES50 Network Port with Klark Teknik SuperMac Technology, and Ultranet Integration with Powerplay P16 Systems	Backstage Rack
3	1	Behringer	S16	16-channel Digital Snake with Remote-controllable Midas-designed Mic Pres, an AES50 Network Port with Klark Teknik SuperMac Technology, and Ultranet Integration with Powerplay P16 Systems	Backstage Rack
4	3	Behringer	SD8-IO	8-channel Digital Snake with 8 Remote-controllable Midas-designed Mic Pres, 8 Outputs, an AES50 Network Port with Klark Teknik SuperMac Technology, and Ultranet Integration with Powerplay P16 Systems	Control Room
5	1	Behringer	X-Control	X-Control App for Apple iPad (Free)	Control Room
6	1	Behringer	XDANTE	Dante Expansion Module with up to 32 Channels of Recording and Playback for Midas M32 and Behringer X32 Digital Mixing Consoles	Control Room
7	1	Klark Teknik	DN9610	Dual-port AES50 Repeater	Backstage

8	12	Audio Technica	ATW-R3210NEE1	3000 Series Network Wireless Receiver (EE1: 530 to 590 MHz)	Backstage Rack
9	14	Audio Technica	ATW-R3210NDE2	3000 Series Network Wireless Receiver (DE2: 470 to 530 MHz)	Backstage Rack + (2) user guest
10	6	Audio Technica	ATW-T3202ADE2	3000 Series Gen 4 Handheld Transmitter/Mic (DE2: 470 to 530 MHz)	Control Room + (1) user guest
11	6	Audio Technica	ATWC510	Interchangeable Cardioid Dynamic Mic Capsule for Audio-technica 3000 Series Handheld Wireless Transmitters	Control Room
12	8	Audio Technica	ATW-T3201ADE2	3000 Series Wireless Bodypack Transmitter (DE2: 470 to 530 MHz)	Control Room + (1) user guest
13	12	Audio Technica	ATWT3201-EE1	3000 Series Wireless Bodypack Transmitter - (EE1 530-590MHz)	Control Room

14	20	Audio Technica	Pro92cH-TH	Wireless Omnidirectional Condenser Headworn Microphone with cH-style Connector for Audio-Technica Wireless - Beige	Control Room
15	20	Audio Technica	MT830cH	Omnidirectional Condenser Lavalier Microphone with cH-style Connector for Audio-Technica Wireless - Black	Control Room + (1) user guest
16	3	RF Venue	D-ARCD9	9-channel Antenna Distribution System with Diversity Architectural Antenna, and 2 x 25' RG8X Coaxial Cables	Backstage Rack/Theater
17	6	QSC	AD-S12BK	600-watt, 8-ohm Weather-resistant Speaker with 12" Woofer, 1.4" Tweeter, and 75-degree Coverage - Black (each)	Theater
18	6	QSC	AD-YMS12-BK	Steel Yoke Mount for AD-S12 Loudspeaker (Black)	Theater-Front Left - Center - Right
19	2	QSC	AD-S112-SW-BK	600W, 8-ohm Passive Subwoofer with 12" Woofer and IP-54-rated Enclosure - Black	Theater - Sub
20	2	Ashly	CA154	1,500-watt, 4-channel Power Amplifier with 70V/100V Compatibility and DSP	Theater

21	3	QSC	CP8	1,000-watt Powered PA Speaker with 8" LF Driver, 1.4" HF Driver, and DSP (each) (For stage monitoring)	Stage Monitors
22	2	Eartec	HUB8S	UltraLITE 8-Person HUB Intercom System	Control room
23	1	Eartec	HB35IL	35" Interlink cable	Control room
				Video	
24	1	Sony	SRGXP1	Compact UHD 4K Box-Style POV Camera with Wide-Angle Lens (Black)	Theater
25	1	Impact	BP-RA-MBH	Right Angle Baby Wall Plate with Mini Ball Head (POV camera mount)	Theater
26	3	LG	55UQ7570PUJ	LG UQ7570PUJ 55" 4K HDR Smart LED TV Remote Control with Battery Stand Assembly Power Cable Limited 1-Year Manufacturer Warranty Additional Resources User Manual VESA 300 x 300mm	Drama Tech Classrooms and Lobby X 2
27	2	LG	43UQ7590PUB	43" HDR 4K UHD LED TVLG UQ7590PUB Remote Control with BatteryStand AssemblyPower CableLimited 1-Year Manufacturer WarrantyVESA 200 x 200mm	Drama Classroom and Control Room
28	2	Monoprice	10473	Tilt TV Wall Mount Bracket Anti-Theft For 32" To 55" TVs up to 99lbs, Max VESA 400x400, UL Certified	Lobby X 2

29	2	Monoprice	8678	Full Motion TV Wall Mount Bracket Low Profile For TVs up to 66lbs, Max VESA 200x200	Drama Classroom and Control Room
30	1	Gabor	FPC-65	Flat panel TV cart for 43" display. Steel Construction, 100 lb Load Capacity Height-Adjustable from 40.6 to 60.2" A/V Shelf and Webcam Platform	Drama Tech Classroom
				Extron - Control and Audio/Video Distribution	
31	1	Extron	60-1381-92	DTP CrossPoint 108 4K IPCP Q SA	
32	5	Extron	60-1755-12	DTP T UWP 4K 232 D Black	
33	1	Extron	60-1421-12	DTP T HWP 4K 231 D - Black	
34	5	Extron	60-1271-12	DTP HDMI 4K 230 Tx	
35	8	Extron	60-1271-13	DTP HDMI 4K 230 Rx	
36	3	Extron	60-1531-12	DTP R HWP 4K 231 D - Black	
37	1	Extron	60-1565-02	TLP Pro 1025T - Black	
38	1	Extron	60-1566-02	TLP Pro 1025M - Black	
39	1	Extron	60-1795-01	NBP 200	
40	1	Extron	60-1511-10	DMP 128 Plus AT - Audio DSP	
41	1	Extron	60-1690-01	AXI 016 - 16 Output Audio Expansion Interface	
42	2	Extron	60-844-03	MPA 152 Plus, Amplifier	
43	3	Extron	42-133-03	SM 3 Speakers, White (Pair)	
44	1	Extron	60-1449-01	MPA 601-70V	
45	2	Extron	60-1881-03	SF 26CT LP, Speakers (Pair)	
46	3	Extron	70-883-02	VCM 200 D	
47	1	Extron	60-583-11	CPM101 BLACK	
48	1	Extron	70-293-12	MAAP (1)3.5mm STR F-SLDR BLK	
49	1	Extron	70-296-12	MAAP (1)3XLR F-SLDR NEUTRIK	
50	1	Extron	70-314-13	MAAP (1)RJ45 F-F BLK SLKSCRN	
51	2	Extron	60-604-11	RSB 126 GRAY Shelf for 6" Deep Products	
52	1	Extron	Extron Control	Extron Control Software - Free for Touchlink Pro touch panels	for Touchlink Pro touch panels
				Networking	

53	1	Netgear	WAX625-100NAS	AX5400 Dual-Band Mult-Gig Wi-Fi 6 Access Point	Theater
54	1	Netgear	JGS524NA	ProSafe 24-Port Gigabit Rackmount Switch	Rack
55	1	Apple	MPQ83LL/A	Apple 10.9" iPad (10th Gen, 256GB, Wi-Fi Only, Silver) for Extron control	Control Room
56	1	Apple	MQLY3AM/A	Apple Pencil (1st Gen) with USB-C to Apple Pencil Adapter	Control Room
57	1	Apple	SP297A1	Encased MagGlass Ultra HD Screen Protector for iPad 10.9" (10th Gen)	Control Room
58	1	Apple	EN29740	Encased Folio Case for 10.9" iPad (10th Gen)	Control Room
59	1	Netgear	GSM4210PX-100NAS	Netgear AV Line M4250 GSM4210PX Ethernet Switch - 8 Ports - Manageable - 10 Gigabit Ethernet - 10GBase-T, 10GBase-X - 3 Layer Supported - 220 W PoE Budget - Optical Fiber, Twisted Pair - PoE Ports - Desktop - Lifetime Limited Warranty	Control Room
				I-O Panels	
60	1	Liberty Engraving		I-O panel for Backstage Right	BSR

61	1	Liberty Engraving		I-O panel for Backstage Left	BSL
62	1	Liberty Engraving		I-O panel for Floor Pocket Right	Floor Pocket Right
63	1	Liberty Engraving		I-O panel for Floor Pocket Left	Floor Pocket Left
64	1	Liberty Engraving		I-O panel for Floor Pocket Center	Floor Pocket Center
65	1	Liberty Engraving		I-O panel for Control room	Control room
				Misc.	
66	1	ULINE	H-8491BL	Pedestrian Cable Protector - 36 x 11 x 2", Channel size 4"x 1" - Black	Theater
67	1	Middle Atlantic	MRK-4431-DVR-AB	Middle Atlantic MRK-4431-DVR-AB MRK Series 19" Configured Digital-Video Recorder Enclosure Rack Frame Ganging Hardware Vented Top Panel Perforated Front Door Split Rear Door 3-1/4" Wide Vertical Lacer Strip 6 x Lacer Bars 12 x 8" Cable Management Straps Thin power strip with cord (20 amp, 20 outlet) Brush Grommets (1U and 2U) Set of Leveling Feet 100 x 10-32 mounting hardware 4 x Rack rails (2 pairs, front and rear) Limited Lifetime Manufacturer Warranty	Back Stage
68	1	Middle Atlantic	PD-2415SC	PD-2415SC	Rack
69	2	Middle Atlantic	D2	2U Utility Drawer - Black	Backstage side Rack (existing)

70	1	APC	SMT2200RM2UC	UPS	Rack

2.3 CUSTOMER FURNISHED EQUIPMENT (CFE)

A. Audio/Video Contractor shall coordinate with the Owner to take Ownership of the Customer Furnished Equipment (CFE) The Audio/Video Contractor shall be responsible for the CFE items once they are received.

2.4 OWNER FURNISHED – CONTRACTOR INSTALLED EQUIPMENT (OFCI)

A. Audio/Video Contractor shall coordinate with the Owner to take Ownership of the Owner Furnished; Contractor-Installed equipment (OFCI) The Audio/Video Contractor shall be responsible for the OFCI items once they are received.

2.5 CUSTOMER FURNISHED EQUIPMENT (CFE)

A. Audio/Video Contractor shall coordinate with the Owner to take Ownership of the Customer Furnished Equipment (CFE) The Audio/Video Contractor shall be responsible for the CFE items once they are received.

2.6 SUBSTITUTIONS

A. Product substitution is allowed only by expressed written consent via Request for Information (RFI) of the Audio/Video Designer or representative of the Owner.

B. The Audio/Video Contractor shall be fully responsible for making a substitute product match the requirements, description, and functionality of the originally specified product regarding all options, accessories, and external interface requirements.

2.7 MATERIALS

A. Cable types and color codes shall follow the table below. All cables shall be Belden or equal with approval.

Signal Type	**Color**	**Belden Cable #**
DTP Cables*	Black	Extron - XTP DTP 24*
Analog Video	Black	1505A
Reference/Sync	Orange	1505A
Analog Audio Ch.1/Left	Brown	9451
Analog Audio Ch.2/Right	Red	9451

Mono	Black	9451
Microphone, Installed	Black	9451
Time Code	White	9451
Control Data	Grey	9451/8723/7881A
Network, Engineering	Blue	7881A
HDMI Extension	Yellow	7881A

*Exception to Belden cables is for the DTP cables for the Extron system.

B. Connector

1. Contractor shall use Neutrik series XLR connectors, black with gold pins or equal.

2. Contractor shall use Neutrik NP3X for TRS ¼ inch phone plugs or equal.

3. Contractor shall use Mil-Spec D connectors with machined gold pins crimped with a minimum 8-point crimp. Hoods shall be plastic, or metal shielded as the design specifies.

4. Contractor shall use EZ-RJ style connectors for CAT 6 cables.

C. Rack Accessories and Installation Hardware

1. Rack filler panels shall be Middle Atlantic PHBL-x series or equal - 11-gauge aluminum, finished in black powder coat or equal and conform to EIA 19-inch standards.

2. Rack screws shall be 10-32 x ¾ inch black oxide Phillips machine screws with integral #10 fiber washers. Middle Atlantic HP or equal.

3. Rack shelves shall be Middle Atlantic or equal aluminum finished in a black powder coat and must conform to EIA 19-inch standards.

PART 3 - EXECUTION

3.1 GENERAL

A. Seismic restraints shall be provided in accordance with applicable building codes as this location is rated as a moderate to severe seismic disturbance zone. Projection and lift equipment mounted to the ceiling must provide a minimum restraint to ASTM 580.

B. Audio/Video Contractor shall firmly secure all equipment in place unless requirements for portability dictate otherwise.

C. Audio/Video Contractor shall ensure all equipment and boxes are installed plumb and square.

3.2 EXAMINATION

A. Audio/Video Contractor shall examine all drawings and specifications before executing the work.

B. Audio/Video Contractor shall verify electrical power requirements, conduits, raceways, and boxes and report any discrepancies and/or conflicts to the architect.

C. Audio/Video Contractor shall check and coordinate interfacing work with other Contractors, as needed.

D. The Audio/Video Contractor shall check all factors influencing the design, function, and performance of the system and be fully cognizant of the requirements.

E. Audio/Video Contractor shall verify all dimensions affecting this project.

F. Audio/Video Contractor shall report immediately any discrepancies to any of the above conditions to the architect.

3.3 COMMON REQUIREMENTS FOR INSTALLATION

A. Furnish all materials, hardware, supplies, equipment, and labor necessary to provide the installation of a working system.

B. Provide all equipment, cables, devices, and/or other materials even though not mentioned specifically herein, which are necessary for the proper installation and operation of the system so that the system shall perform the function described herein in compliance with the specified requirements.

C. Installation

1. Site Preparation:

a. Audio/Video installation shall not begin until hard construction has been completed in the equipment areas. The areas shall be clean and free of dust and fumes such as paint or varnishes. The HVAC system shall be tested and operational.

1) An exception is made when cables must be pulled in construction areas before ceilings or walls are closed up.

b. Protect surrounding areas and surfaces to preclude damages.

c. Exercise care to avoid soiling or damaging the OFCI equipment and the work of others.

d. Clean all existing racks, consoles, and cabinetry in preparation for receiving the new work.

2. Identification Systems:

   a. Audio/Video Contractor shall clearly, logically, and permanently affix cable labels to each terminated end of each cable. The cable label shall include the wire number, source, and destination at a minimum. Example: HD204: DTP CP to DTP TX-07

   b. All labels shall be affixed at 4 inches from each terminated cable end.

   c. Brady or Tyton-type self-laminating cable labels shall be used at each terminated cable end. Labels shall have a write-on area of .5 inches high by 2 inches wide.

   d. All Input/output (I/O) panels will be clearly labeled with permanent labeling identifying each source or destination.

   e. P-Touch-style self-adhesive labeling shall be used on equipment to indicate the system name for each device. Additionally, equipment with multiple inputs shall have a P-Touch style label placed either on the equipment or nearby on a rack or console to indicate the source of each input.

   f. Rack and console labels shall be engraved plastic, phenolic, or engraving stock-style labels where appropriate. The contractor shall not affix their own company’s name to any rack or parts of the system.

3. Wiring:

   a. All installation wiring shall be neat and orderly with no crossed-over cables within a bundle. Wires shall run parallel to each other.

   b. Audio/Video Contractor shall separate logical signal types providing separation between high-level and low-level signals i.e., microphone audio and speaker level audio by a minimum of 4 inches where possible.

   c. Audio/Video Contractor shall cross all AC power at 90 degrees where possible.

   d. Audio/Video Contractor shall take care to relieve cable stress and tension. Make appropriate use of cable ties, tie bases, and rear rack rails.

   e. Audio/Video Contractor shall provide service loops on all equipment that is not rear rack accessible or has rack slides associated with the installation.

   f. Tech-flex style braid shall be used where practical to ensure a smooth flow of cables dressed for service loops.

   g. Audio/Video Contractor shall provide strain relief for pig-tails and umbilicals using braided flexible cable sheaths such as Tech Flex.

   h. Audio/Video Contractor shall avoid sharp bends in cable. Maintain the minimum bend radius according to the cable manufacturer's recommendation.

i. Audio/Video Contractor shall make all connections to screw terminals with crimp on insulated spade lugs wherever practical.

j. Crimped ferrules shall be used on individual wires for all Phoenix or WECO style screw/compression connections unless otherwise specified on the single line documents or standard terminations page.

k. Audio/Video Contractor shall take all precautions to eliminate ground loops, induced hum, jitter, electrical noise, or other electromagnetic, electrostatic, or common mode interferences. The contractor shall provide isolation or matching devices as necessary.

l. Audio/Video Contractor shall run surface-mounted cable in Panduit or other approved ducting to maintain neat and orderly cable infrastructure upon approval.

m. Audio/Video Contractor shall insulate all shields with sleeving to reduce the possibility of shorts or ground loops.

n. Heat shrink tubing shall be used where cable jackets have been cut for terminations. This does not typically apply to coax cable but to multi-conductor cable where it breaks out of the outer cable jacket. The shrink tube will also hold the sleeving in place.

o. Audio/Video Contractor shall ground audio shields typically at one end only as described on the single line documentation or other grounding scheme.

p. Audio/Video Contractor shall use ground isolators where unusual ground problems exist.

q. Do NOT use ground lift adapters anywhere in the system.

r. Audio/Video Contractor shall follow current TIA-568 B standards for telecommunications wiring in ceilings. Cables shall be supported using cable hanging devices as local building codes require.

s. Audio/Video Contractor shall establish a single primary ground for the system. The contractor shall use the solid isolated ground buss bars in the equipment racks as the primary distribution of the technical ground.

t. Velcro tie-wraps shall be used for most cable bundling but should only be tight enough to hold the cables in position. They should never be tight enough to leave a permanent indentation in the cable jacket where the cable dielectric may be crushed.

u. Plastic tie-wraps or zip ties should not be equally spaced on coax cable or other cable transporting high-frequency signals. This can cause a periodic reflection and degrade the cables' return loss characteristics.

v. Velcro shall be used to support coax cables that transport HD 1.485 Gb/s and above cables.

w. Audio/Video Contractor shall route cables, so they do not come into contact with anything sharp that may over time due to vibration or pulling on the cable cause an abrasion or hole to form in the cable jacket.

x. Audio/Video Contractor shall ensure that ceiling wires are bent upwards before or immediately after installation to avoid the risk of stabbing.

y. Audio/Video Contractor shall ensure cables are secured in clips and clips are secured to ceiling wires.

z. Audio/Video Contractor shall ensure ceiling wire is securely attached to the ceiling before hanging cable.

aa. Do NOT hang more cables than the clip will support (i.e. attaching a bundle to a clip with a tie wrap)

bb. Do NOT mix speaker cabling with line-level audio, control, or video.

cc. Do NOT hang clips on other trades' wires or wires used to secure ceiling grids, ducts, electrical boxes, struts or anything else as this is a violation of building codes.

4. Cable Terminations and Pin-Outs:

a. XLR connectors shall use pin 2 as "hot", and pin 1 as "ground".

b. Contractor shall use cable pinouts as designated in the drawing set or otherwise specified by the Owner.

5. Equipment Mounting:

a. All equipment shall be rack mounted according to manufacturer specifications. Rack screws shall be 10-32 x ¾ inch black oxide Phillips head machine screws with integral #10 fiber washers. Middle Atlantic HP or equal.

b. Contractor shall install all equipment not rack mounted according to the manufacturer's recommendation or following generally accepted installation guidelines.

c. Equipment that does not have a specific mounting solution provided by the manufacturer shall be adapted to make a secure and serviceable mounting solution. This will usually be mounted to a blank rack panel and provide a Velcro or bolt/nut mounting configuration. Self-drilling Tech screws may also be used to secure items to consoles or blank rack panels where practical. This needs to be pre-approved before the installation of the mounting solution.

6. Cleaning:

    a. Clean each section or area of the work after completion to permit immediate use of the area. Remove and dispose of all refuse, rubbish, and debris promptly and completely.

    b. Audio/Video Contractor shall clean all provided equipment of dust, dirt, smudges, and other foreign material that may degrade the image or contaminate air filters or equipment mechanisms.

    c. Audio/Video Contractor shall leave carpets free from solder flecks, tiny pieces of braid, or stranded cable pieces. Audio/Video Contractor shall ensure all carpets are vacuumed at the end of the project. Carpets shall also be vacuumed intermittently throughout the job as needed to maintain a clean work site.

    d. At the conclusion of the project and before sign-off off by the Owner, the Audio/Video Contractor shall clean all fan filters in the equipment and blow out any dust with compressed dry air. The system must be like new when it is turned over to the Owner.

D. Testing

1. Upon completion of the installation of the system, the Audio/Video Contractor shall perform a Continuity test or “copper test” of all cables; contractor-installed, manufacturer-provided, and pre-made. Document this test for review by the Owner’s consultant.

2. Audio/Video Contractor shall power up all equipment to verify as best as possible that the equipment is in good working order and that no device is DOA.

E. Project Completion:

1. When the Audio/Video Contractor determines that the work has been completed, they shall notify the General Contractor who will schedule a Substantial Completion Review within 7 working days of notification. This review will include:

    a. Physical inventory of all equipment on site.

    b. Demonstration of all equipment powering on and passing signal.

    c. Subjective and objective testing to determine performance compliance with this specification.

    d. The Audio/Video Contractor shall remove and re-install the equipment for repairs, modifications, and adjustments to said equipment to meet the functional requirements as specified. Notification shall be made to the General contractor, and Audio/Video designer before doing so.

e. The Audio/Video Contractor shall bear all the costs associated with bringing the system into installation specification compliance promptly. Further reviews will be rescheduled when all repairs, modifications, or adjustments have been completed.

END OF SECTION