Mt. Diablo Unified School District
Purchasing & Warehouse Department
2326 Bisso Lane, Concord, CA 94520-4802

Mt. Diablo Unified School District Technology Infrastructure Upgrade at Northgate High School

Project #24103.01

BID #1951

SPECIFICATIONS
Volume II

Technology Infrastructure upgrade along with Electrical, Painting and Anchorage/Bracing.

196 ARCHITECTS

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END OF DOCUMENT

DOCUMENT 01 11 00

SUMMARY OF WORK

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Submittals; and

1.1.5. Temporary Facilities and Controls.

1.2. SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

The Work may consist of the following:

1.2.1. Demolish old or abandoned data network, audiovisual, analog telephone, analog intercom and fully re-cable the data network, copper and fiber, utilizing a combination of new and existing pathways. Establish MDF and IDF locations as indicated on the plans. Provide new (N) Bogen Nyquist Intercom System. Project may require swing and/or graveyard and/or weekend and/or holiday work schedules.

1.2.2. The Project will involve the "phasing" and barricading of work areas as indicated on the Plans and enumerated in these Specifications. **[**

1.3. CONTRACTS

Perform the Work under a single, fixed-price Contract.

1.4. SPECIAL PROJECT REQUIREMENTS

1.4.1. Hours of Work: Work is to be performed during regular work hours. Contractor shall coordinate its operations with activities taking place at each campus such as summer school. Contractor shall ensure that there are no disruptions to such activities.

1.4.2. Owner Occupancy: Mt. Diablo Unified School District staff will be returning to the campus for the fall session on July 24, a fully functional data network must be installed and running prior to owner occupancy.

1.5. CODES, REGULATIONS AND STANDARDS

1.5.1. The codes, regulations, and standards adopted by the State and federal agencies having jurisdiction shall govern minimum requirements for the Project. Where codes, regulations, and standards conflict with the Contract Documents, these conflicts shall be brought to the immediate attention of the District and the Architect.

1.5.2. Codes, regulations, and standards are as published effective as of date of bid opening, unless otherwise specified or indicated.

1.6. EXAMINATION OF EXISTING CONDITIONS

1.6.1. Contractor shall be held to have examined the Project Site and acquainted itself with the conditions of the Site and of the streets and roads approaching the Site.

1.6.2. Prior to commencement of Work, Contractor shall survey the Site and existing buildings and improvements to observe existing damage and defects such as cracks, sags, broken, missing or damaged glazing, other building elements and Site improvements, and other damage.

1.6.3. Should Contractor observe cracks, sags, and other damage to and defects of the Site and adjacent buildings, paving, and other items not indicated in the Contract Documents, Contractor shall immediately report same to the District and the Architect.

1.7. CONTRACTOR'S USE OF PREMISES

1.7.1. Contractor shall take all reasonable precautions for the safety of the students and the school employees throughout the duration of the Project.

1.7.2. If unoccupied and only with District’s prior written approval, Contractor may use the building(s) at the Project Site without limitation for its operations, storage, and office facilities for the performance of the Work. If the District chooses to beneficially occupy any building(s), Contractor must obtain the District's written approval for Contractor's use of spaces and types of operations to be performed within the building(s) while so occupied. Contractor's access to the building(s) shall be limited to the areas indicated.

1.7.3. If the space at the Project Site is not sufficient for Contractor's operations, storage, office facilities and/or parking, Contractor shall arrange and pay for any additional facilities needed by Contractor, at no expense to District.

1.7.4. Contractor shall not interfere with others use of or access to occupied portions of the building(s) or adjacent property.

1.7.5. Contractor shall maintain corridors, stairs, halls, and other exit-ways of building clear and free of debris and obstructions at all times.

1.7.6. No one other than those directly involved in the demolition and construction or specifically designated by the District or the Architect shall be permitted in the areas of Work during demolition and construction activities.

1.8. PROTECTION OF EXISTING STRUCTURES AND UTILITIES

1.8.1. The Drawings show above-grade and below-grade structures, utility lines, and other installations that are known or believed to exist in the area of the Work. Contractor

shall locate these existing installations before proceeding with excavation and other operations that could damage same; maintain them in service, where appropriate; and repair damage to them caused by the performance of the Work. Should damage occur to these existing installations, the costs of repair shall be at the Contractor's expense and made to the District's satisfaction.

1.8.2. Contractor shall be alert to the possibility of the existence of additional structures and utilities. If Contractor encounters additional structures and utilities, Contractor will immediately report to the District for disposition of same as indicated in the General Conditions.

1.9. UTILITY SHUTDOWNS AND INTERRUPTIONS

1.9.1. Contractor shall give the District a minimum of three (3) days written notice in advance of any need to shut off existing utility services or to effect equipment interruptions. District will set exact time and duration for shutdown, and will assist Contractor with shutdown. Work required to re-establish utility services shall be performed by the Contractor.

1.9.2. Contractor shall obtain District's written approval as indicated in the General Conditions in advance of deliveries of material or equipment or other activities that may conflict with District's use of the building(s) or adjacent facilities.

1.10. STRUCTURAL INTEGRITY

1.10.1. Contractor shall be responsible for and supervise each operation and work that could affect structural integrity of various building elements, both permanent and temporary.

1.10.2. Contractor shall include structural connections and fastenings as indicated or required for complete performance of the Work.

1.11. ENVIRONMENTAL REQUIREMENTS

END OF DOCUMENT

DOCUMENT 01 12 10

CONTRACT FORMS AND SUBMITTALS

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Submittals; and

1.1.5. Construction Schedule.

2. REQUIREMENTS OF THE DISTRICT

2.1. Contractor shall utilize the District's forms as indicated below This requirement also applies to submittals, including the requirement that the Contractor and its Subcontractors, as indicated, utilize the software, internet and specific programs on this Project as indicated herein.

2.2. DISTRICT FORMS

All forms identified below shall utilize District forms available at the above referenced link. Contractor must only utilize these forms, including the programs, processes and software indicated below.

2.2.1. **Request for Information.** Contractor shall comply with all applicable provisions in Contract Documents relating to Requests for Information. Contractor shall submit all of its Requests for Information using District's Form attached hereto.

2.2.2. **Construction Directive.** Contractor shall comply with all applicable provisions in Contract Documents relating to Changes in the Work. All Construction Directives shall be issued using District's Form attached hereto.

2.2.3. **Price Request.** Contractor shall comply with all applicable provisions in Contract Documents relating to Price Requests. All Price Requests shall be issued using District's Form attached hereto.

2.2.4. **Proposed Change Order.** Contractor shall comply with all applicable provisions in Contract Documents relating to Changes in the Work. Contractor shall submit all of its Proposed Change Orders using District's Form attached hereto.

2.2.5. **Change Order.** Contractor shall comply with applicable provisions in Contract Documents relating to Changes in the Work. All Change Orders shall be issued using District's Form attached hereto.

2.3. CONTRACTOR SUBMITTALS

All submittals required by the Contract Documents shall be submitted using the programs, processes and software indicated below. If no specific program or format is indicated, then Microsoft Word or Microsoft Excel is acceptable.

2.3.1. **Preliminary Construction Schedule**

2.3.1.1. Utilize Primavera P6 Project Management® software (latest version) by Oracle (PCM) (http://www.oracle.com/us/industries/engineering-and-construction/index.html) or another program if pre-approved by the District.

2.3.2. **Schedule of Values**

2.3.2.1. Utilize PCM or another program if pre-approved by the District.

2.3.3. **Contractor's Completed Subcontractor List**

2.3.4. **Contractor's Safety Plan**

2.3.5. **Schedule of Submittals**

2.3.5.1. Utilize PCM or another program if pre-approved by the District.

2.3.6. **Operations and Maintenance Manual & Instructions**

END OF DOCUMENT

DOCUMENT 01 20 00

PRICE AND PAYMENT PROCEDURES

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any).

1.2. DESCRIPTION

1.2.1. This Document contains procedures to be followed by the Contractor to request payment.

1.2.2. **IF THERE IS ANY INCONSISTENCY IN THIS DOCUMENT WITH THE PROVISIONS IN THE GENERAL CONDITIONS AND THE SPECIAL CONDITIONS THAT THE CONTRACTOR SHALL COMPLY WITH RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES (e.g., "PAYMENTS," "SCHEDULE OF VALUES"), THOSE PROVISIONS IN THE GENERAL CONDITIONS AND THE SPECIAL CONDITIONS SHALL TAKE PRECEDENCE.**

1.3. SECTION INCLUDES

1.3.1. Schedule of Values.

1.3.2. Application for Payment.

1.4. SCHEDULE OF VALUES

1.4.1. Provide a breakdown of the Contract Price with enough detail to facilitate continued evaluation of Applications for Payment and Progress Reports utilizing or another program if pre-approved by the District.

1.4.2. Contractor must update and resubmit the Schedule of Values before the next Invoice or Application for Payment when Change Orders or Construction Change Directives result in a change in the Contract Price.

1.4.3. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule. Comply with the provisions in the General Conditions regarding the Schedule of Values.

1.4.3.1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:

1.4.3.1.1. Application for Payment forms.

1.4.3.1.2. Submittal Schedule.

1.4.3.1.3. Contractor's Construction Schedule.

1.4.3.2. Submit the Schedule of Values to District as indicated in the Contract Documents and, if an updated Schedule of Values is needed, then no later than ten (10) days before the date scheduled for submittal of the next Application(s) for Payment.

1.4.3.3. Subschedules: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.

1.4.4. 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.

1.4.4.1. Identification: Include the following Project identification on the Schedule of Values:

1.4.4.1.1. Project name and location.

1.4.4.1.2. Name of District's Representative.

1.4.4.1.3. District's contract number (_____).

1.4.4.1.4. District's name and address.

1.4.4.1.5. Date of submittal.

1.4.4.2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

1.4.4.2.1. Related Specification document, section or division.

1.4.4.2.2. Description of the Work.

1.4.4.2.3. Name of subcontractor.

1.4.4.2.4. Name of manufacturer or fabricator.

1.4.4.2.5. Name of supplier.

1.4.4.2.6. Change Orders (numbers) that affect value.

1.4.4.2.7. Dollar value.

1.4.4.2.7.1. Percentage of the Contract Price to nearest one-hundredth percent, adjusted to total 100 percent.

1.4.4.3. Provide a breakdown of the Contract Price in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. 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.

1.4.4.4. Round amounts to nearest whole dollar; total shall equal the Contract Price.

1.4.4.5. 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.

1.4.4.6. 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.

1.4.4.7. Allowances (if any): Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.

1.4.4.8. Each item in the Schedule of Values and Applications for Payments shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

1.4.5. Schedule Updating: Update and resubmit the Schedule of Values before the next Application for Payment if there is a change in the Contract Price.

1.5. APPLICATIONS FOR PAYMENT

1.5.1. **Form:** Contractor shall utilize AIA Form G702 - Application and Certificate for Payment and AIA Form G703 - Continuation Sheet, or District-approved form with the same information as these AIA forms.

1.5.2. **Content and Format**: District shall use Schedule of Values for listing items in its Application for Payment.

1.5.3. Each Application for Payment shall be consistent with previous applications and payments as certified and paid for by District.

END OF DOCUMENT

DOCUMENT 01 21 00

ALLOWANCES

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISION

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions including without limitation, Contract Terms and Definitions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any).

1.1.4. Agreement;

1.1.5. Bid Form; and

1.2. SUMMARY

1.2.1. **THE SPECIFIC ALLOWANCES FOR THIS PROJECT ARE AS LISTED IN THE AGREEMENT.**

1.2.2. This Document includes administrative and procedural requirements governing Allowances.

1.2.3. Certain items are specified in the Contract Documents by Allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements may be issued by Change Order or similar document.

1.3. SELECTION AND PURCHASE

1.3.1. At the earliest practical date after award of the Contract, Contractor shall advise District of the date when final selection and purchase of each product or system described by an Allowance must be completed to avoid delaying the Work.

1.3.2. At District's request, obtain proposals for each Allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

1.3.3. Purchase products and systems selected by District from the designated supplier.

1.4. SUBMITTALS

1.4.1. Submit proposals for purchase of products or systems included in Allowances, in the form specified for Change Orders.

1.4.2. Submit invoices or delivery slips to show actual quantities of materials delivered to the Site for use in fulfillment of each Allowance.

1.4.3. Coordinate and process submittals for Allowance items in same manner as for other portions of the Work.

1.5. COORDINATION

Coordinate Allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.6. PAYMENT FOR ALLOWANCES

1.6.1. Allowance shall include all-inclusive cost to Contractor of specific products and materials under Allowance and Contractor may bill its time, materials, and other items in the identical structure as a Change Order.

1.7. UNUSED MATERIALS

1.7.1. Return unused materials purchased under an Allowance to manufacturer or supplier for credit to District, after installation has been completed and accepted.

1.7.2. If requested, prepare and deliver unused material for storage by District when it is not economically practical (as determined by District) to return the material for credit. If directed, deliver unused material to District's storage space. Otherwise, disposal of unused material is Contractor's responsibility.

2. EXECUTION

2.1. EXAMINATION

Examine products covered by an Allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

2.2. PREPARATION

Coordinate materials and their installation for each Allowance with related materials and installations to ensure that each Allowance item is completely integrated and interfaced with related work.

END OF DOCUMENT

DOCUMENT 01 23 00

ALTERNATES AND UNIT PRICING

1. ALTERNATES AND UNIT PRICES

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Bid Form and Proposal; and

1.1.5. Instruction to Bidders.

2. ALTERNATES

2.1. DESCRIPTION

An amount proposed by Contractor and stated in its Bid Form for certain work defined in the Instruction to Bidders, Bid Form or Contract Documents that may be added to or deducted from the Base Bid amount. The acceptance or rejection of any of the alternates is strictly at the option of the District and subject to District's acceptance of Contractor's stated prices contained in this Proposal.

The cost or credit for each alternate is the net addition to or deduction from the Contract Price to incorporate the alternate into the Work. No other adjustments are made to the Contract Price.

2.2. GENERAL:

2.2.1. Coordination: Contractor shall modify or adjust adjacent work as necessary to completely integrate work of the alternate into the Project.

2.2.1.1. Include as part of each alternate, miscellaneous devices, accessories and similar items incidental to or required for a complete installation whether or not indicated as part of the alternate.

2.2.1.2. Include as part of each alternate, the costs of related coordination, modification, or adjustments.

2.2.2. If District accepts an alternate, Contractor shall perform the work of the alternate under the same conditions as other Work required by Contract Documents.

2.2.3. Notification: Immediately following award of the Contract, Contractor shall notify all of its Subcontractor(s) in writing of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

2.2.4. Schedule of Alternates: A Schedule of Alternates is included at the end of this Document. Specifications referenced in the Schedule of Alternates contain requirements for materials necessary to achieve the Work described under each alternate.

3. UNIT PRICING

3.1. DESCRIPTION

An amount proposed by Contractor and stated in its Bid Form for certain work defined in the Instruction to Bidders and Bid Form that may be priced by unit. The acceptance or rejection of any of the unit prices is strictly at the option of the District and subject to District's acceptance of Contractor's stated prices contained in the Bid Form and may be subsequently negotiated prior to incorporation on Change Order(s).

3.2. GENERAL

Contractor shall completely state all required figures based on Unit Prices required in the Bid Form. Where scope of Work is decreased, all Work pertaining to the item, whether specifically stated or not, shall be omitted and where scope of Work is increased, all work pertaining to that item required to render same ready for use on the Project in accordance with intention of Drawings and Specifications shall be included in an agreed upon price amount.

3.3. UNIT PRICES

Furnish unit prices for each of the named items on a square foot, lineal foot, or per each basis, as requested and applicable. Unit prices shall include all labor, materials, services, profit, overhead, insurance, bonds, taxes, and all other incidental costs of Contractor, subcontractors, and supplier(s).

END OF DOCUMENT

DOCUMENT 01 25 10

PRODUCT OPTIONS AND SUBSTITUTIONS

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any); and

1.1.4. Instructions to Bidders.

1.2. DOCUMENT INCLUDES

1.2.1. Product options.

1.2.2. Limitations on Substitutions.

1.2.3. Regulatory Requirements.

1.2.4. Substitution Representation.

1.2.5. Submittal Procedure.

1.2.6. District's Review.

1.3. DEFINITIONS

1.3.1. Requests for changes in products, materials, or equipment required by Contract Documents proposed by the Contractor prior to and after award of the Contract are considered requests for substitutions. Contractor must refer to the Instructions to Bidders, the General Conditions and the Special Conditions for limitations on when requests for substitution(s) are permitted on Project. The following are not considered substitutions:

1.3.1.1. Revisions to Contract Documents requested by the District or Architect.

1.3.1.2. Specified options of products, materials, and equipment included in Contract Documents.

1.3.2. Whenever in the Specifications any material, product, thing, or service is indicated or specified by grade, patent, or proprietary name, or by name of manufacturer, that Specification shall be deemed to be used for the purpose of facilitating the description

of the material, product, thing, or service, and shall be deemed to be followed by the words "or equal," except:

1.3.2.1. When designated to match other material, product, thing, or service in use on a particular public improvement either completed or in the course of completion; or

1.3.2.2. When designated as a field test or experiment.

1.4. PRODUCT OPTIONS

1.4.1. **Products Specified by Reference Standards or by Description Only**: Any Product meeting those standards or description.

1.4.2. **Products Specified by Naming One or More Manufacturers with or without Provision for Substitution**: Products of manufacturers named and meeting specifications with substitution of Products or manufacturer only when submitted under provisions of this section.

1.5. LIMITATIONS ON SUBSTITUTIONS

1.5.1. **Requests for substitution prior to bid or after bid, shall only be permitted as indicated in and in accordance with requirements specified in the Instructions to Bidders and the Special Conditions.**

1.5.2. The Bid shall be based upon the standards of quality established by those items of equipment and/or materials which are specifically identified in the Contract Documents.

1.5.3. Burden of proof of merit of requested substitution is the responsibility of the Contractor.

1.5.4. It is the sole responsibility of Contractor to submit the proper content of any requests for substitutions. Incomplete submittals will be rejected.

1.6. REGULATORY REQUIREMENTS

1.6.1. It shall be the responsibility of Contractor to obtain all regulatory approvals required for proposed substitutions.

1.6.2. All regulatory approvals shall be obtained for proposed substitutions prior to submittal of substitution request to Architect.

1.6.3. All costs incurred by the District in obtaining regulatory approvals for proposed substitutions to include the costs of the Architect and any authority having jurisdiction over the Project shall be reimbursed to the District. Costs of these services shall be reimbursed regardless of final acceptance or rejection of substitution.

1.6.4. Substitutions of materials or work procedures which affect the health, safety and welfare of the public shall have prior approval of the Division of the State Architect (DSA) field representative.

1.7. SUBSTITUTION REPRESENTATION

1.7.1. In submitting a request for substitution, Contractor makes the representation that:

1.7.2. Contractor has investigated the proposed substitution and determined that it meets or exceeds the quality level of the specified product;

1.7.3. Contractor has determined that all components of the proposed substitution are identical and fully interchangeable with the product name and number specified;

1.7.4. Contractor will provide the same warranty or guarantee for the substitution as for the specified product;

1.7.5. Contractor will coordinate installation and make changes to other work which may be required for the work to be completed with no additional cost to the District;

1.7.6. Contractor waives claims for additional cost or time extension which may subsequently become apparent; and

1.7.7. Contractor will reimburse District for the cost of District's and Architect's review or redesign services associated with substitution request.

1.8. SUBMITTAL PROCEDURE

1.8.1. Submit six (6) copies of each request.

1.8.2. Submit request using District's Substitution Request Form as indicated in Contract Forms and Submittals. Substitution requests that are not on District's required form shall be returned without review.

1.8.3. Limit each request to one proposed substitution.

1.8.4. Request to include sufficient data so that direct comparison of proposed substitution can be made.

1.8.5. Provide complete documentation for each request. Documentation shall include the following information, as appropriate, as a minimum:

1.8.5.1. Statement of cause for substitution request.

1.8.5.2. Identify product by specification section and article number.

1.8.5.3. Provide manufacturer's name, address, and phone number. List fabricators, suppliers, and installers as appropriate.

1.8.5.4. List similar projects where proposed substitution has been used, dates of installation and names of Architect and District.

1.8.5.5. List availability of maintenance services and replacement materials.

1.8.5.6. Documented or confirmation of regulatory approval.

1.8.5.7. Product data, including drawings and descriptions of products.

1.8.5.8. Fabrication and installation procedures.

1.8.5.9. Samples of proposed substitutions.

1.8.5.10. Itemized comparison of significant qualities of the proposed substitution with those of the product specified. Significant qualities may include size, weight, durability, performance requirements and visual effects.

1.8.5.11. Coordination information, including a list of changes or modifications needed to other items of work that will become necessary to accommodate proposed substitution.

1.8.5.12. Statement on the substitutions effect on the Construction Schedule.

1.8.5.13. Cost information including a proposal of the net reduction in cost to the Contract Price if the proposed substitution is accepted.

1.8.5.14. Certification that the substitution is equal to or better in every respect to that required by the Contract Documents and that substitution will perform adequately in the application intended.

1.8.5.15. Waiver of right to additional payment or time that may subsequently become necessary because of failure of substitution to perform adequately.

1.8.6. Inadequate warranty, vagueness of submittal, failure to meet specified requirements, or submittal of insufficient data will be cause for rejection of substitution request.

1.9. DISTRICT'S REVIEW

1.9.1. The District will accept or reject proposed substitution within a reasonable amount of time.

1.9.2. If a request is made prior to bid opening and the District has not completed its review, Contractor shall base its bid on the product specified only.

1.9.3. There shall be no claim for additional time for review of proposed substitutions.

1.9.4. Final acceptance of a substitution submitted prior to the date established for the receipt of bids will be in the form of an addendum.

END OF DOCUMENT

DOCUMENT 01 26 00

CONTRACT MODIFICATION PROCEDURES

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Allowances;

1.1.5. Product Options and Substitutions; and

1.1.6. Project Coordination.

1.2. DESCRIPTION

1.2.1. This Document contains procedures to be followed by the Contractor to request changes in the Contract Time of the Contract Price.

1.2.2. **IF THERE IS ANY INCONSISTENCY IN THIS DOCUMENT WITH THE PROVISIONS IN THE GENERAL CONDITIONS AND THE SPECIAL CONDITIONS THAT THE CONTRACTOR SHALL COMPLY WITH RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES (e.g., "Change in the Work"), THOSE PROVISIONS IN THE GENERAL CONDITIONS AND THE SPECIAL CONDITIONS SHALL TAKE PRECEDENCE.**

1.3. SUMMARY

This Document specifies administrative and procedural requirements for handling and processing Contract modifications.

1.4. Minor Changes in the Work

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

1.5. Construction Change Process – DSA

1.5.1. **Changes or alterations of the approved plans or specifications after a contract for the work has been let affecting the Structural, Access, or Fire-Life Safety portions of the**

Project shall be made only by means of Construction Change Document submitted to and approved by DS prior to commencement of the work shown thereon. Construction Change Documents shall comply with DSA IR A-6. Construction Change Document Submittal and approval process (Title 24, Part 1, California Code or Regulations, Section 4-338) requirements. Construction Change Documents shall be made using DSA form 141 and state the reason for the change and the scope of work to be accomplished, and, where necessary, shall be accompanied by supplementary drawings referenced in the text of the change order. All Construction Change Documents and supplementary drawings shall be stamped and signed by the Architect or Engineer in general responsible charge of observation of the work of construction of the Project and by the Architect or registered engineer delegated responsibility for observation for the portion of the work of construction affected by the change order, shall bear the approval of the school board and shall indicate the associated change in the project cost, if any. Once copy of each Construction Change Document is required for the files of DSA.

1.5.2. **Construction Change Documents shall be signed by Architect of Record, Structural Engineer (when applicable), Delegated Professional Engineer (when applicable), and DSA.**

1.5.3. **No changes shall be made to approved documents without DSA approval.**

1.5.4. **If conflicts between the drawings and specifications for materials to be used and/or work to be done the more stringent, more restrictive, or higher quality shall apply.**

1.6. PRICE REQUESTS

1.6.1. Do not consider Price Requests to be instructions either to stop work in progress or to execute the proposed change.

1.6.2. Within time specified in Price Request after receipt of Price Request, submit a quotation estimating cost adjustments to the Contract Price and the Contract Time necessary to execute the change.

1.6.2.1. 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.

1.6.2.2. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

1.6.2.3. Include costs of labor and supervision directly attributable to the change.

1.6.2.4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

1.7. PROPOSED CHANGE ORDERS

Contractor may propose changes by submitting a request for a change on District's Proposed Change

Order form (PCO) to District.

1.7.1. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

1.7.2. Comply with Contract Document requirements if the proposed change requires substitution of one product or system for product or system specified.

END OF DOCUMENT

DOCUMENT 01 26 10

REQUESTS FOR INFORMATION

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Documentation Requirements;

1.1.5. Electronic Data Transfer;

1.1.6. Submittals;

1.1.7. Contract Closeout and Final Cleaning;

1.1.8. Operation and Maintenance Data;

1.1.9. Warranties; and

1.1.10. Record Documents;

1.2. DESCRIPTION

This Document contains procedures to be followed by the Contractor to request Architect provide additional information necessary to clarify or amplify an item in the Contract Documents that Contractor thinks is not clearly shown or called for in the Drawings or Specifications or other portions of the Contract Documents, or to address issues that have arisen under field conditions.

1.3. PROCEDURES

1.3.1. Notification by Contractor:

1.3.1.1. Submit all requirements for clarification or additional information, whether originated by the Contractor, a Subcontractor, or supplier at any tier, in writing to District as required by the Contract Documents.

1.3.1.2. Number RFIs sequentially. Follow RFI number with sequential alphabetical suffix as necessary for each resubmission. For example, the first RFI would be "001." The second RFI would be "002."

1.3.1.3. All RFIs shall reference all applicable Contract Document(s), including Specification section(s), detail(s), page number(s), drawing number(s), and sheet number(s), etc. Contractor shall make suggestions and interpretations of

the issue raised by each RFI. An RFI cannot modify the Contract Price, Contract Time, or the Contract Documents.

1.3.1.4. Limit each RFI to one subject.

1.3.1.5. Submit a RFI if one of the following conditions occurs:

1.3.1.5.1. Contractor discovers an unforeseen condition or circumstance that is not described in the Contract Documents.

1.3.1.5.2. Contractor discovers an apparent conflict or discrepancy between portions of the Contract Documents that appears to be inconsistent or is not reasonably inferred from the intent of the Contract Documents.

1.3.2. Contractor shall not:

1.3.2.1. Submit an RFI as a request for substitution.

1.3.2.2. Submit an RFI as a submittal.

1.3.2.3. Submit an RFI without first having thoroughly reviewed the Contract Documents.

1.3.2.4. Submit an RFI in a manner that suggests that specific portions of the Contract Documents are assumed to be excluded or by taking an isolated portion of the Contract Documents in part rather than whole.

1.3.2.5. Submit an RFI in an untimely manner without proper coordination and scheduling of Work related trades.

1.3.2.6. If Contractor submits an RFI contrary to the above, Contractor shall pay the cost of any review, which cost shall be deducted from the Contract Price.

1.3.3. Contractor shall be liable to the District for all costs incurred by the District associated with the processing, reviewing, evaluating and responding to any RFI, including without limitation, fees of the Architect and any other design consultant to the Architect or the District, that District reasonably determines:

1.3.3.1. Does not reflect adequate or competent supervision or coordination by the Contractor or any Subcontractor; or

1.3.3.2. Does not reflect the Contractor's adequate or competent knowledge of the requirements of the Work or the Contract Documents;

1.3.3.3. Requests an interpretation or decision of a matter where the information sought is equally available to the Contractor; or

1.3.3.4. Is not justified for any other reason.

1.4. RESPONSE TIME

1.4.1. Architect shall review RFIs and issue a response and instructions to Contractor within a reasonable time frame from the date the RFI is received and dated by the District.

1.4.2. Responses from the District will not change any requirement of the Contract unless so noted by the District in the response to the RFI. Should the Contractor contend that a response to an RFI causes a change to the Contract that requires a Change Order, the Contractor shall, before proceeding, give written notice to the District, indicating that the Contractor considers the District's response to the RFI to be a Change Order, as required by the Contract Documents.

1.4.3. Should Contractor direct its Subcontractors to proceed with the Work affected before receipt of a response from Architect, any portion of the Work which is not done in accordance with the Architect's ultimate interpretations, clarifications, instructions, or decisions is subject to removal or replacement at Contractor's sole expense and responsibility.

END OF DOCUMENT

DOCUMENT 01 31 00

COORDINATION AND PROJECT MEETINGS

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS:

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any); and

1.1.4. Technical Specifications.

1.2. SECTION INCLUDES

1.2.1. Coordination Responsibilities of the Contractor.

1.2.2. Field Engineering Responsibilities of the Contractor.

1.2.3. Preconstruction Conference.

1.2.4. Progress Meetings.

1.2.5. Pre-Installation Conferences.

1.2.6. Post Construction Dedication.

1.3. COORDINATION RESPONSIBILITIES OF THE CONTRACTOR

1.3.1. Coordinate scheduling, submittals, and Work of the Specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

1.3.2. Prior to commencement of a particular type or kind of Work examine relevant information, contract documents, and subsequent data issued to the Project.

1.3.3. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate Work of various sections having interdependent responsibilities for installing, connecting to, and placing in service such equipment.

1.3.4. Closing up of holes, backfilling, and other covering up operations shall not proceed until all enclosed or covered Work and inspections have been completed. Verify before proceeding.

1.3.5. Coordinate space requirements and installation of mechanical and electrical Work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and

conduit as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

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

1.3.7. In locations where several elements of mechanical and electrical Work must be sequenced and positioned with precision in order to fit into available space, prepare coordination drawings showing the actual conditions required for the installation. Prepare coordination drawings prior to purchasing, fabricating, or installing any of the elements required to be coordinated.

1.3.8. Closing up of walls, partitions or furred spaces, backfilling, and other covering up operations shall not proceed until all enclosed or covered Work and inspections have been completed. Verify before proceeding.

1.3.9. Coordinate completion and cleanup of Work of separate sections in preparation for completion and for portions of Work designated for District's occupancy.

1.3.10. After District occupancy of Project, coordinate access to Site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of District's activities.

1.3.11. Coordinate all utility company Work in accordance with the Contract Documents.

1.3.12. Key Personnel Names: Within ten (10) 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. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.4. FIELD ENGINEERING RESPONSIBILITIES OF THE CONTRACTOR

1.4.1. Contractor shall employ a Land Surveyor registered in the State of California and acceptable to the Architect.

1.4.2. Control datum for survey is that established by District provided survey. Contractor to locate and protect survey control and reference points.

1.4.3. Replace dislocated survey control points based on original survey control.

1.4.4. Provide field engineering services. Establish elevations, lines, and levels utilizing recognized engineering survey practices.

1.4.5. Upon completion of Work, submit certificate signed by the Land Surveyor that elevations and locations of Work are in conformance with Contract Documents. Record deviations on Record Drawings.

1.5. PRECONSTRUCTION CONFERENCE

1.5.1. Construction Manager or Project Engineer will schedule a conference immediately after, and in no case more than fifteen (15) days after, receipt of fully executed Contract Documents prior to Project mobilization.

1.5.2. Mandatory Attendance: Construction Manager, Project Engineer, Project Inspector, Architect of Record, Contractor, Contractor's Project Manager, and Contractor's Job/Project Superintendent.

1.5.3. Optional Attendance: Architect's consultants, and utility company representatives.

1.5.4. Construction Manager shall preside at conference and the Project Architect shall prepare and record minutes and distribute copies.

1.5.5. Agenda:

1.5.5.1. Execution of Owner-Contractor Agreement.

1.5.5.2. Issue Notice to Proceed.

1.5.5.3. Submission of executed bonds and insurance certificates.

1.5.5.4. Distribution of Contract Documents.

1.5.5.5. Submission of list of Subcontractors, list of Products, Schedule of Values, and Progress Schedule.

1.5.5.6. Designation of responsible personnel representing the parties.

1.5.5.7. Procedures for processing Change Orders.

1.5.5.8. Procedures for Request for Information.

1.5.5.9. Procedures for testing and inspecting.

1.5.5.10. Procedures for processing applications for payment.

1.5.5.11. Procedures for Project closeout.

1.5.5.12. Use of Premises.

1.5.5.13. Work restrictions.

1.5.5.14. District’s occupancy requirements or options.

1.5.5.15. Responsibility for temporary facilities and controls.

1.5.5.16. Construction waste management and recycling.

1.5.5.17. Parking availability.

1.5.5.18. Office, work and storage areas.

1.5.5.19. Equipment deliveries and priority.

1.5.5.20. Security.

1.5.5.21. Progress cleaning.

1.5.5.22. Review required submittals and (if applicable) LEED Certification requirements.

1.6. PROGRESS MEETINGS

1.6.1. Construction Manager shall schedule and administer meetings throughout progress of the Work at a minimum of every week.

1.6.2. Construction Manager or Project Engineer will make arrangements for meetings, prepare agenda, and preside at meetings. Project Architect shall record minutes (Field Reports), and distribute copies.

1.6.3. Attendance Required: Job Superintendent, Construction Manager, Project Engineer, Project Inspector, Architect of Record, Subcontractors, and suppliers as appropriate to agenda topics for each meeting.

1.6.4. Agenda:

1.6.4.1. Review minutes of previous meetings (Field Reports).

1.6.4.2. Review of Work progress.

1.6.4.3. Field observations, problems, and decisions.

1.6.4.4. Identification of problems which impede planned progress.

1.6.4.5. Review of submittals schedule and status of submittals.

1.6.4.6. Review of off-site fabrication and delivery schedules.

1.6.4.7. Maintenance of construction schedule.

1.6.4.8. Corrective measures to regain projected schedules.

1.6.4.9. Planned progress during succeeding work period.

1.6.4.10. Coordination of projected progress.

1.6.4.11. Maintenance of quality and work standards.

1.6.4.12. Effect of proposed changes on progress schedule and coordination.

1.6.4.13. Other business relating to Work.

1.6.5. District has authority to schedule mandatory meetings other than those listed, as

necessary.

1.7. PRE-INSTALLATION CONFERENCES

1.7.1. When required in individual specification section, Contractor shall convene a pre-installation conference prior to commencing Work of the section. Refer to individual specification section for timing requirements of conference.

1.7.2. Contractor shall require its Subcontractors and suppliers directly affecting, or affected by, Work of the specific section to attend.

1.7.3. Notify the Construction Manager, Project Engineer, Project Inspector, and Architect of Record four (4) days in advance of meeting date.

1.7.4. A pre-installation conference may coincide with a regularly scheduled progress meeting.

1.7.5. Contractor shall prepare agenda, preside at conference, record minutes, and distribute copies within two (2) days after conference to participants.

1.7.6. The purpose of the meeting will be to review Contract Documents, conditions of installation, preparation and installation procedures, and coordination with related Work and manufacturer's recommendations.

1.7.7. Pre-installation Schedule: As a minimum, Work being installed under the Contract Documents technical sections will require pre-installation conferences. Contractor shall review the technical specifications and add all additional requirements for pre-installation meetings contained in those sections.

1.8. POST CONSTRUCTION DEDICATION

1.8.1. Attendance Required: Project Superintendent, Contractor, Project Manager, major Subcontractors, Construction Manager, Project Engineer, Project Inspector, and Architect of Record.

1.8.2. Preparation prior to Dedication: Contractor and appropriate Subcontractors and suppliers shall:

1.8.3. Assist District in operation of mechanical devices and systems.

1.8.3.1. Verify operation and adjust controls for communication systems.

1.8.3.2. Assist District in operation of lighting systems.

END OF DOCUMENT

DOCUMENT 01 32 16

CONSTRUCTION SCHEDULE – NETWORK ANALYSIS

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISION

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Coordination and Meetings; and

1.1.5. Submittals.

1.2. REFERENCES

1.2.1. Construction Planning and Scheduling Manual - A Manual for General Contractors and the Construction Industry, The Associated General Contractors of America (AGC).

1.2.2. CSI - Construction Specifications Institute MP-2-1 Master Format.

1.2.3. U.S. National Weather Service - Local Climatological Data.

1.3. PERFORMANCE REQUIREMENTS

1.3.1. Ensure adequate scheduling during construction activities so Work may be prosecuted in an orderly and expeditious manner within stipulated Contract Time.

1.3.2. Ensure coordination of Contractor and Subcontractors at all levels.

1.3.3. Ensure coordination of submittals, fabrication, delivery, erection, installation, and testing of products, materials and equipment.

1.3.4. Ensure on-time delivery of District furnished products, materials and equipment.

1.3.5. Ensure coordination of jurisdictional reviews.

1.3.6. Prepare applications for payment.

1.3.7. Monitor progress of Work.

1.3.8. Prepare proper requests for changes to Contract Time.

1.3.9. Prepare proper requests for changes to Construction Schedule.

1.3.10. Assist in detection of schedule delays and identification of corrective actions.

1.4. QUALITY ASSURANCE

1.4.1. Perform scheduling work in accordance with Construction Planning and Scheduling Manual published by the AGC.

1.4.2. Maintain one copy of Construction Planning and Scheduling Manual on Site.

1.4.3. In the event of discrepancy between the AGC publication and the Contract Documents, provisions of the Contract Documents shall govern.

1.5. QUALIFICATIONS

1.5.1. **Scheduler**:

1.5.1.1. Contractor shall retain a construction scheduler to work in enough capacity to perform all of the Contractor's requirements to prepare the Construction Schedule. The Scheduler shall plan, coordinate, execute, and monitor a cost/resource loaded CPM schedule as required for Project and have a minimum of five (5) years direct experience using Primavera Project Management.

1.5.1.2. Scheduler will cooperate with District and shall be available on site for monitoring, maintaining and updating schedules in a timely manner.

1.5.1.3. District has the right to reject the Scheduler based upon a lack of experience as required by this Document or based on lack of performance and timeliness of schedule submittals/fragnets on past projects. Contractor shall within seven (7) calendar days of District's rejection, propose another scheduler who meets the experience requirements stated above.

1.5.2. **Administrative Personnel**: Five (5) years minimum experience in using and monitoring schedules on comparable projects.

1.6. SUBMITTALS

1.6.1. Submit Short Interval Schedule at each Construction Progress Meeting.

1.6.2. Submit Time Adjustment Schedule within five (5) days of commencement of a claimed delay.

1.6.3. Submit Recovery Schedules as required for timely completion of Work or when demanded by the District.

1.6.4. Submit job cost reports when demanded by the District.

1.6.5. Submit one (1) reproducible and two (2) copies of each schedule and cost report.

1.6.6. Submit large format plotted schedules monthly or at the request of the District or Construction Manager.

1.7. REVIEW AND EVALUATION

1.7.1. Contractor shall participate in joint review of Construction Schedule and Reports with District and Architect.

1.7.2. Within seven (7) days of receipt of District and/or Architect's comments provide satisfactory revision to Construction Schedule or adequate justification for activities in question.

1.7.3. In the event that an activity or element of Work is not detected by District or Architect review, such omission or error shall be corrected by next scheduled update and shall not affect Contract Time.

1.7.4. Acceptance by District of corrected Construction Schedule shall be a condition precedent to making any progress payments.

1.7.5. Cost-loaded values of Construction Schedule shall be basis for determining progress payments.

1.7.6. Review and acceptance by District and Architect of Preliminary Construction Schedule or Construction Schedule does not constitute responsibility whatsoever for accuracy or feasibility of schedules nor does such acceptance expressly or impliedly warrant, acknowledge or admit reasonableness of activities, logic, duration, manpower, cost or equipment loading stated or implied on schedules.

1.8. FORMAT

1.8.1. Prepare diagrams and supporting mathematical analyses using Precedence Diagramming Method, under concepts and methods outlined in AGC Construction Planning and Scheduling Manual, or other method pre-approved by District.

1.8.2. **Listings**: Reading from left to right, in ascending order for each activity.

1.8.3. **Diagram Size**: 42 inches maximum height x width required.

1.8.4. **Scale and Spacing**: To allow for legible notations and revisions.

1.8.5. Illustrate order and interdependence of activities and sequence of Work.

1.8.6. Illustrate complete sequence of construction by activity.

1.8.7. Provide legend of symbols and abbreviations used.

1.9. COST AND SCHEDULE REPORTS

1.9.1. **Activity Analysis**: Tabulate each activity of network diagram and identify for each activity:

1.9.1.1. Description.

1.9.1.2. Interface with outside contractors or agencies.

1.9.1.3. Number.

1.9.1.4. Preceding and following number.

1.9.1.5. Duration.

1.9.1.6. Earliest start date.

1.9.1.7. Earliest finish date.

1.9.1.8. Actual start date.

1.9.1.9. Actual finish date.

1.9.1.10. Latest start date.

1.9.1.11. Latest finish date.

1.9.1.12. Total and free float.

1.9.1.13. Identification of critical path activity.

1.9.1.14. Monetary value keyed to Schedule of Values.

1.9.1.15. Manpower requirements.

1.9.1.16. Responsibility.

1.9.1.17. Percentage complete.

1.9.1.18. Variance positive or negative.

1.9.2. **Cost Report**: Tabulate each activity of network diagram and identify for each activity:

1.9.2.1. Description.

1.9.2.2. Number.

1.9.2.3. Total cost.

1.9.2.4. Percentage complete.

1.9.2.5. Value prior to current period.

1.9.2.6. Value this period.

1.9.2.7. Value to date.

1.9.3. **Required Sorts**: List activities in sorts or groups:

1.9.3.1. By activity number.

1.9.3.2. By amount of float time in order of early start.

1.9.3.3. By responsibility in order of earliest start date.

1.9.3.4. In order of latest start dates.

1.9.3.5. In order of latest finish dates.

1.9.3.6. Application for payment sorted by Schedule of Values.

1.9.3.7. Listing of activities on critical path.

1.9.4. Listing of basic input data which generates schedule.

1.10. CONSTRUCTION SCHEDULE

1.10.1. Contractor shall develop and submit a cost loaded preliminary schedule of construction (or Preliminary Construction Schedule) as required by this Document and the Contract Documents. It shall be submitted in computer generated network format and shall be organized by Activity Codes representing the intended sequencing of the Work, and with time scaled network diagrams of activities. The Preliminary Construction Schedule shall include activities such as mobilization, preparation of submittals, specified review periods, procurement items, fabrication items, milestones, and all detailed construction activities.

1.10.2. Upon District's acceptance of the Preliminary Construction Schedule, Contractor shall update the accepted Preliminary Construction Schedule until Contractor's Construction Schedule is fully developed and accepted. Since updates to the Construction Schedule are the basis for payment to Contractor, submittal and acceptance of the Construction Schedule and updates shall be a condition precedent to making of monthly payments, as indicated in the General Conditions.

1.10.3. Failure to submit an adequate or accurate Preliminary Construction Schedule, Construction Schedule, updates thereto or failure to submit on established dates, will be considered a breach of Contract.

1.10.4. Failure to include any activity shall not be an excuse for completing all Work by required Completion Date.

1.10.5. Activities of long intervals shall be broken into increments no longer than fourteen (14) days or a value over $20,000.00, unless approved by the District or it is a non-construction activity for procurement and delivery.

1.10.6. The Construction Schedule shall comply with the following and include the following:

1.10.6.1. Provide a written narrative describing Contractor's approach to mobilization, procurement, and construction during the first thirty (30) calendar days including crew sizes, equipment and material delivery, Site access, submittals, and permits.

1.10.6.2. Shall designate critical path or paths.

1.10.6.3. Procurement activities to include mobilization, shop drawings and sample submittals.

1.10.6.4. Identification of key and long-lead elements and realistic delivery dates.

1.10.6.5. Construction activities in units of whole days limited to fourteen (14) days for each activity except non-construction activities for procurement and delivery.

1.10.6.6. Approximate cost and duration of each activity.

1.10.6.7. Shall contain seasonal weather considerations.

1.10.6.8. Indicate a date for Project Completion that is no later than Completion Date subject to any time extensions processed as part of a Change Order.

1.10.6.9. Conform to mandatory dates specified in the Contract Documents.

1.10.6.10. Contractor shall allow for inclement weather in the Proposed Baseline Schedule by incorporating an activity titled "Rain Day Impact Allowance" as the last activity prior to the Completion Milestone. No other activities may be concurrent with it. The duration of the Rain Day Impact Allowance activity will be in accordance with the Special Conditions, and will be calculated from the Notice to Proceed until the Completion.

1.10.6.11. Level of detail shall correspond to complexity of work involved.

1.10.6.12. Indicate procurement activities, delivery, and installation of District furnished material and equipment.

1.10.6.13. Designate critical path or paths.

1.10.6.14. Subcontractor work at all levels shall be included in schedule.

1.10.6.15. As developed, shall show sequence and interdependence of activities required for complete performance of Work.

1.10.6.16. Shall be logical and show a coordinated plan of Work.

1.10.6.17. Show order of activities and major points of interface, including specific dates of completion.

1.10.6.18. Duration of activities shall be coordinated with Subcontractors and suppliers and shall be best estimate of time required.

1.10.6.19. Shall show description, duration and float for each activity.

1.10.7. **Activity.** An activity shall meet the following criteria:

1.10.7.1. Any portion or element of Work, action, or reaction that is precisely described, readily identifiable, and is a function of a logical sequential process.

1.10.7.2. Descriptions shall be clear and concise. Beginning and end shall be readily verifiable. Starts and finishes shall be scheduled by logical restraints.

1.10.7.3. Responsibility shall be identified with a single performing entity.

1.10.7.4. Additional codes shall identify building, floor, bid opening and/or District's receipt of proposals, whichever is acceptable and CSI classification.

1.10.7.5. Assigned dollar value (cost-loading) of each activity shall cumulatively equal total contract amount. Mobilization, bond and insurance costs shall be separate. General requirement costs, overhead, profit, shall be prorated throughout all activities. Activity costs shall correlate with Schedule of Values.

1.10.7.6. Each activity shall have manpower-loading assigned.

1.10.7.7. Major construction equipment shall be assigned to each activity.

1.10.7.8. Activities labeled start, continue or completion are not allowed.

1.10.8. **Equipment and Materials.** For major equipment and materials show a sequence of activities including:

1.10.8.1. Preparation of shop drawings and sample submissions.

1.10.8.2. Review of shop drawings and samples.

1.10.8.3. Finish and color selection.

1.10.8.4. Fabrication and delivery.

1.10.8.5. Erection or installation.

1.10.8.6. Testing.

1.10.9. Include a minimum of fifteen (15) days prior to Completion Date for punch lists and clean up. No other activities shall be scheduled during this period.

1.11. SHORT INTERVAL SCHEDULE

1.11.1. The Four-Week Rolling Schedule shall be based on the most recent District Accepted Construction Schedule or Update. It shall include weekly updates to all construction, submittal, fabrication/procurement, and separate Work Contract activities. Contractor shall ensure that it accurately reflects the current progress of the Work.

1.11.2. Shall be fully developed horizontal bar-chart-type schedule directly derived from Construction Schedule.

1.11.3. Prepare schedule on sheet of sufficient width to clearly show data.

1.11.4. Provide continuous heavy vertical line identifying first day of week.

1.11.5. Provide continuous subordinate vertical line identifying each day of week.

1.11.6. Identify activities by same activity number and description as Construction Schedule.

1.11.7. Show each activity in proper sequence.

1.11.8. Indicate graphically sequences necessary for related activities.

1.11.9. Indicate activities completed or in progress for previous two (2) week period.

1.11.10. Indicate activities scheduled for succeeding three (3) week period.

1.11.11. Further detail should be added if necessary to monitor schedule or if requested by District.

1.12. REQUESTED TIME ADJUSTMENT SCHEDULE

1.12.1. Updated Construction Schedule shall not show a Completion Date later than the Contract Time, subject to any time extensions processed as part of a Change Order.

1.12.2. If an extension of time is requested, a separate schedule entitled "Requested Time Adjustment Schedule" shall be submitted to District and Architect.

1.12.3. Indicate requested adjustments in Contract Time which are due to changes or delays in completion of Work.

1.12.4. Extension request shall include forecast of Project Completion date and actual achievement of any dates listed in Contract Documents.

1.12.5. To the extent that any requests are pending at time of any Construction Schedule update, Time Adjustment Schedule shall also be updated.

1.12.6. Schedule shall be a time-scaled network analysis.

1.12.7. Accompany schedule with formal written time extension request and detailed impact analysis justifying extension.

1.12.8. Time impact analysis shall demonstrate time impact based upon date of delay, and status of construction at that time and event time computation of all affected activities. Event times shall be those as shown in latest Construction Schedule.

1.12.9. Activity delays shall not automatically constitute an extension of Contract Time.

1.12.10. Failure of Subcontractors shall not be justification for an extension of time.

1.12.11. Float is not for the exclusive use or benefit of any single party. Float time shall be apportioned according to needs of Project, as determined by the District.

1.12.12. Float suppression techniques such as preferential sequencing, special lead/lag logic restraints, extended activity durations, or imposed dates shall be apportioned according to benefit of Project.

1.12.13. Extensions will be granted only to extent that time adjustments to activities exceed total positive float of the critical path and extends Completion date.

1.12.14. District shall not have an obligation to consider any time extension request unless requirements of Contract Documents, and specifically, but not limited to these requirements, are complied with.

1.12.15. District shall not be responsible or liable for any construction acceleration due to failure of District to grant time extensions under Contract Documents should requested adjustments in Contract Time not substantially comply with submission and justification requirements of Contract for time extension requests.

1.12.16. In the event a Requested Time Adjustment Schedule and Time Impact Analysis are not submitted within ten (10) days after commencement of a delay it is mutually agreed that delay does not require a Contract Time extension.

1.13. RECOVERY SCHEDULE

1.13.1. When activities are behind Construction Schedule a supplementary Recovery Schedule shall be submitted.

1.13.2. Contractor shall prepare and submit to the District a Recovery Schedule whenever activities are behind Construction Schedule or at any time requested by the District, at no cost to the District.

1.13.3. Form and detail shall be sufficient to explain and display how activities will be rescheduled to regain compliance with Construction Schedule and to complete the Work by the Completion Date.

1.13.4. Maximum duration shall be one (1) month and shall coincide with payment period.

1.13.5. Ten (10) days prior to expiration of Recovery Schedule, Contractor shall have to show verification to determine if activities have regained compliance with Construction Schedule. Based upon this verification the following will occur:

1.13.5.1. Supplemental Recovery Schedule will be submitted to address subsequent payment period.

1.13.5.2. Construction Schedule will be resumed.

1.14. UPDATING SCHEDULES

1.14.1. Review and update schedules at least ten (10) days prior to submitting an Application for Payment.

1.14.2. Maintain schedules to record actual prosecution and progress.

1.14.3. Approved Change Orders which affect schedules shall be identified as separate new activities.

1.14.4. Change Orders of less than $5,000.00 value or less than three (3) days duration need not be shown unless critical path is affected.

1.14.5. No other revisions shall be made to schedules unless authorized by District.

1.14.6. **Schedule Narrative Report**: Contractor shall include a written report to explain the Monthly Schedule Update. The narrative shall, at a minimum, include the following headings with appropriate discussions of each topic:

1.14.6.1. Activities or portions of activities completed during previous reporting period.

1.14.6.2. Actual start dates for activities currently in progress.

1.14.6.3. Deviations from critical path in days ahead or behind.

1.14.6.4. List of major construction equipment used during reporting period and any equipment idle.

1.14.6.5. Number of personnel by trade engaged on Work during reporting period.

1.14.6.6. Progress analysis describing problem areas.

1.14.6.7. Current and anticipated delay factors and their impact.

1.14.6.8. Proposed corrective actions and logic revisions for Recovery Schedule.

1.14.6.9. Proposed modifications, additions, deletions and changes in logic of Construction Schedule.

1.14.6.10. In updating the Schedule, Contractor shall not modify Activity ID numbers, schedule calculation rules/criteria, or the Activity Coding Structure required.

1.14.7. Schedule update will form basis upon which progress payments will be made.

1.14.8. District will not be obligated to review or process Application for Payment until the Construction Schedule and Schedule Narrative Report have been submitted.

1.15. DISTRIBUTION

1.15.1. Following joint review and acceptance of updated schedules distribute copies to District, Architect, and all other concerned parties.

1.15.2. Instruct recipients to promptly report in writing any problem anticipated by projections shown in schedules.

2. PRODUCTS

2.1. SCHEDULING SOFTWARE

Contractor shall utilize District-approved software and shall employ the Critical Path Method (CPM) in the development and maintenance of the Construction Schedule The scheduling software shall be capable of being resource loaded with manpower, costs and materials. It shall also be capable of generating time-scaled logic diagrams, resource histograms and profiles, bar charts, layouts and reports with any and/or all activity detail.

2.2. ELECTRONIC DATA

Provide compact disk(s) that contain a back-up of the Proposed Baseline Schedule data on it and in a format approved by the District.

END OF DOCUMENT

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 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. Consult individual sections of specifications for specific submittals required under those sections and for further details and descriptions of requirements.

C. Related Sections include the following:
   1. Division 1 Section "Payment Procedures" for submitting Applications for Payment and the Schedule of Values.
   2. Division 1 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
   3. Division 1 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
   4. Division 1 Section "Closeout Procedures" for submitting warranties.
   5. Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
   6. Division 1 Section "Closeout Procedures" for submitting operation and maintenance manuals.
   7. Division 1 Section "Closeout Procedures" for submitting videotapes of demonstration of equipment and training of Owner's personnel.
   8. Other Sections for specific requirements for submittals in those Sections.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Architect's responsive action.

B. Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

A. Processing: All costs for printing, preparing, packaging, submitting, mailing, or delivering submittals for initial submittals and all costs for re-printing, re-drawing, re-drafting, re-packaging, re-submitting, and re-mailing or re-delivering as required for all re-submittals shall be included in Contract Sum.

B. Sequence: Transmit each submittal in sequence which will not result in Architect's review having to be later modified or rescinded by reason of subsequent submittals which should have been processed earlier or concurrently for coordination. Resubmitted submittals must have the original number with an R numerical sequence.
   1. Identify Project and Architect's project number, Contractor, Subcontractor or supplier; pertinent Drawing sheet and detail number(s), and specification Section number, as appropriate;
   2. Apply Contractor's stamp, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the Work and Contract Documents. **Submittals without Contractor's stamp and signature will be returned without review.**

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. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing

F. Multiple Reviews: The Contractor shall also be responsible for all costs to Architect or Architect consultants for reviews requiring more than two (2) reviews for same specification section.
   1. Contractor shall reimburse the District through deduction from amounts due the Contractor upon receipt of the Architect's billing and that of the Architect's consultants at standard billing rates for all time and expenses incurred in unanticipated reviews.
   2. Submittals will be reviewed and stamped by the Architect as:
      a. "No exceptions taken" (NET),
      b. "Furnish as Noted" (FAN),
      c. "Revise and Resubmit" (R&R),
      d. "Rejected" (REJ),
      e. " Other"

Terms are defined as follows:

f. No Exceptions Taken (NET): Accepted subject to its compatibility with future submittals and additional partial submittals for portions of the work not covered in this submittal. Does not constitute approval or deletion of specified or required items not shown in the partial submittal.

g. Furnish as Noted (FAN) - The submitted item is found to be in conformance with the contract documents with the exceptions of a few minor clarifications, those clarifications maybe noted and the submittal returned with no further actions. No resubmittal required.

h. Revise and resubmit (R&R): The Submitted item is NOT found to conform with the construction documents, the submitted item will be returned with comments stating how the submitted item does not conform. Rejected because of major inconsistencies or errors which shall be resolved or corrected by the Contractor prior to subsequent review by the Architect. A further re-submittal is required by the contractor in order to construct this portion of the project.

i. Rejected (REJ): Submitted material does not conform to plans and specifications in major respect. For example, wrong size, model, capacity or material. Resubmit.

j. Other: May indicate the following:

1) Submit specified item (SSI): Submit to the Architect the items indicated for review. The submittal review requires additional information that does not need to be submitted alongside the original submittal.

2) Not reviewed (NR) – Returned without Architect's review if item is not applicable or has been reviewed previously.

G. File naming Submittals reviewed by the Architect which have been stamped shall be deemed to have the following language affixed and made a part thereof, regardless of the initial or subsequent readability of the actual stamp

1. Corrections or comments made on submittals during this review do not relieve the contractor from compliance with the requirements of the drawings and specifications. This check is for review of general conformance with the design concept of the project and general compliance with information given in the Contract Documents. The contractor is responsible for confirming and correlating all quantities and dimensions, selection of fabrication processes and techniques of construction, coordinating the work of the trades; and performing the work in a safe and satisfactory manner.

H. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Review: Allow 21 days for review of each submittal. Architect will request for more time if needed.

I. Submittal Review

1. The General Contractor is solely responsible for coordination of submittals among all related crafts performing the Work. The General Contractor shall verify that their Sub-Contractors' submittals are complete in every way and meet the requirements of the Contract.

2. Architect's review of submittals is, as a primary objective, to assist in the completion of the project on time and in conformance with the Contract requirements by permitting review of material and fabricated items prior to ordering. Architect's review of submittals is based only on the data presented and extends only to conformance with general design intent and information contained in the Contract Documents.
3. The Architect's and/or design team's review of submittals does not constitute final acceptance or unqualified approval of items or work proposed or put in place, nor does it constitute acceptance of responsibility for the accuracy, coordination or completeness of submittals. ***The Architect's and/or design team's review of submittals, stamped as No Exceptions Taken (NET) or Furnish as Corrected (FAC) does not relieve the Contractor from the responsibility for errors, omissions, or compliance with all the requirements of the Contract Documents.***
4. In the event a submittal presented for review by the design team includes any deviations, changes, or substitutions from the contract documents, such change shall be clearly identified and graphically indicated by clouding. If deviations are not highlighted by the contractor and not noted by the design team upon return of submittal, the General Contractor is still responsible for correcting the deviation, once identified, to comply with the contract documents.
5. If a deviation/change/substitution presented requires additional engineering and/or submittal and review by DSA, the General Contractor is responsible for any professional fees/costs that the owner may incur with.

J. 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 6 by 8 inches on label or beside title block to record Contractor's review and approval markings, and action taken by Architect.
3. Include the following information on label for processing and recording action taken:
   a. Project name.
   b. Date.
   c. Name and address of Architect.
   d. Name and address of Contractor.
   e. Name and address of subcontractor.
   f. Name and address of supplier.
   g. Name of manufacturer.
   h. Each submittal number shall be unique as follows:
      1) Format shall be as follows:
         a) Project Specification Section Number Sequential Number - Revision Number - (e.g., 09 91 00 -001.1). Do not use letters.
      2) Sample submittal log would look like the following in the submittal number column:

Submittal Number
09 91 00-001
09 91 00-001R1(revised submittal: shown for clarity)
05 51 00-002
07 70 00-003

   i. Number and title of appropriate Specification Section.
   j. Drawing number and detail references, as appropriate.

k. Location(s) where product is to be installed, as appropriate.
l. Other necessary identification.

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

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

M. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.
1. Transmittal Form: Use AIA Document G810.

N. 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.
a. Identify all changes made since previous submittal.
3. Make all corrections or revisions required by reviewer's comments at Contractor’s expense and resubmit as initially specified above. No additional costs will be authorized for corrections or revisions
4. Resubmit submittals until they are marked “Approved” or “Furnish as Noted”.

O. Distribution: Furnish copies of final submittals with Architects / Engineer (and DSA as applicable) stamps of review to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms. Instruct parties to promptly report any inability to comply with provisions. Contractor is responsible for coordination of submittals and comments following review. Contractor to provide all additional reproduction costs for copies required by the Contractor at its expense. No additional costs will be authorized for Contractor costs pertaining to submittals.

P. Use for Construction: Use only final submittals with mark indicating stamped by Architect.

Q. Submittals not requested will not be recognized or processed. Submittals not requested will be returned without review.

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.
      a. Circle items applicable.
      b. Cross-out items not applicable.
      c. Select item number if required.
   3. Submittal data must include complete documentation relating to all the specified features
   4. Include the following information, as applicable:
      a. Manufacturer’s Submittal Form with all the options selected when available.
      b. Manufacturer's written recommendations.
      c. Manufacturer's product specifications.
      d. Manufacturer's installation instructions.
      e. Standard color charts.
      f. Manufacturer's catalog cuts.
      g. Wiring diagrams showing factory-installed wiring.
      h. Printed performance curves.
      i. Operational range diagrams.
      j. Mill reports.
      k. Standard product operation and maintenance manuals.
      l. Compliance with specified referenced standards.
      m. Testing by recognized testing agency.
      n. Application of testing agency labels and seals.
      o. Notation of coordination requirements.
   5. Submit Product Data before or concurrent with Samples.
   6. Number of Copies: Submit 6 copies of Product Data, unless otherwise indicated. Architect will return 2 copies. Mark up and retain one returned copy as a Project Record Document.

C. Shop Drawings Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
   1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
      a. Dimensions.
      b. Do not use words "by others." Use words which depict exactly who is responsible for the work.
      c. Identification of products.
      d. Fabrication and installation drawings.
      e. Roughing-in and setting diagrams.

f. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
g. Shopwork manufacturing instructions.
h. Templates and patterns.
i. Schedules.
j. Design calculations.
k. Compliance with specified standards.
l. Notation of coordination requirements.
m. Notation of dimensions established by field measurement.
n. Relationship to adjoining construction clearly indicated.
o. Seal and signature of professional engineer if specified.
p. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
3. Contractor shall upload / post (1) electronic copy of the product literature,

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:
a. Generic description of Sample.
b. Product name and name of manufacturer.
c. Sample source.
d. Number and title of appropriate Specification Section.
3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
a. Number of Samples: Submit 1 full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing

color, texture, and pattern; color range sets; and components used for independent testing and inspection.

a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.
   1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
   2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
   1. Type of product. Include unique identifier for each product.
   2. Number and name of room or space.
   3. Location within room or space.
   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."

G. Application for Payment: Comply with requirements specified in Division 1 Section "Payment Procedures."

H. Schedule of Values: Comply with requirements specified in Division 1 Section "Payment Procedures."

2.2 INFORMATIONAL SUBMITTALS

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

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

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

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

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

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

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

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

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

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

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

L. Schedule of Tests and Inspections: Comply with requirements specified in Division 1 Section "Quality Requirements."

M. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

N. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

O. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

P. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment.

Q. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

R. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
   1. Preparation of substrates.
   2. Required substrate tolerances.
   3. Sequence of installation or erection.
   4. Required installation tolerances.
   5. Required adjustments.
   6. Recommendations for cleaning and protection.

S. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
   1. Name, address, and telephone number of factory-authorized service representative making report.
   2. Statement on condition of substrates and their acceptability for installation of product.
   3. Statement that products at Project site comply with requirements.
   4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
   5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
   6. Statement whether conditions, products, and installation will affect warranty.
   7. Other required items indicated in individual Specification Sections.

T. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

2.3 DEFERRED APPROVALS AND DELEGATED DESIGN

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

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit 3 copies of a statement, signed and sealed by 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.

C. Installation of deferred approval items shall not be started until detailed plans, specifications, and engineering calculations have been accepted and signed by the Architect or Engineer in general responsible charge of design and signed by a California registered Architect or professional engineer who has been delegated responsibility covering the work shown on a particular plan or specification and approved by the agency having authority (e.g., State Fire Marshall, Division of the State Architect, gas company, electrical utility company, water district, etc.). Deferred approval items for this Project are as indicated in the Summary of Work.

D. Unless otherwise indicated in the Contract Documents or if District provides written approval of a longer time period, Contractor shall submit all deferred approval items for approval within thirty (30) days of the notice to proceed with the Construction Phase.

E. Deferred approval drawings and specifications become part of the approved documents for the Project when they are submitted to and approved by the DSA.

F. Submit material using electronic submittal process as defined above.

G. Identify and specify all supports, fasteners, spacing, penetrations, etc., for each of the deferred approval items, including calculations for each and all fasteners.

H. Submit documents to Architect for review prior to forwarding to DSA.

I. Documents shall bear the stamp and signature of the Structural, Mechanical, or Electrical Engineer licensed in the State of California who is responsible for the work shown on the documents.

J. Architect and its subconsultants will review the documents only for conformance with design concept shown on the documents. The Architect will then forward the Submittal to DSA.

K. Contractor shall respond to review comments made by DSA and revise and resubmit submittal to the Architect for re-submittal to DSA.

L. Contractor is notified that significant lead time is required for deferred approval review by DSA and shall schedule work accordingly. No extension of Contract Time will be allowed for delays incurred by deferred approval review. The Architect is not responsible for DSA delays in deferred approval review

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. **Contractor shall mark with approval stamp before submitting to Architect.**
   1. Coordinate the work; do not delegate responsibility for coordination to any subcontractor.
   2. Anticipate the interrelationship of all subcontractors and their relationship with the total work.
   3. Resolve differences or disputes between subcontractors and materials suppliers concerning coordination, interference, or extent of work between sections.
   4. Trade submittals with “By Others”, “By General Contractor”, or similar coordination and work scope are not allowed. Identify, acknowledge, and resolve scope of work prior to submittal by Contractor. No extras will be allowed. Provide complete and coordinated submittals.

B. Approval Stamp: **Stamp each submittal with a uniform, approval stamp by the General Contractor**. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action. Submittals without the Contractors review stamp will be returned without action, no additional time will be allowed for incomplete/ returned submittals.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken.

C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

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

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

END OF SECTION

DOCUMENT 01 40 00

QUALITY REQUIREMENTS

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Drawings;

1.1.5. Construction Schedule – Network Analysis;

1.1.6. General Definitions and References.

1.2. SUMMARY

1.2.1. This Document includes administrative and procedural requirements for quality assurance and quality control.

1.2.2. Testing and inspecting services by the District are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Documents' requirements.

1.2.2.1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Specifications for those activities. Requirements in those Specifications may also cover production of standard products.

1.2.2.2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Documents' requirements.

1.2.2.3. Requirements for Contractor to provide quality-assurance and -control services required by District, District's consultants, or authorities having jurisdiction are not limited by provisions of this Document.

1.3. DEFINITIONS

1.3.1. 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.

1.3.2. 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 District or its consultants.

1.3.3. Mock-ups: Full-size, physical assemblies that are constructed on-site. Mock-ups 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 mock-ups establish the standard by which the Work will be judged.

1.3.4. Laboratory Mock-ups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.

1.3.5. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

1.3.6. Product Testing: Tests and inspections that are performed by an NRTL (National Recognized Testing Laboratory), an NVLAP (National Voluntary Laboratory Accreditation Program), or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.

1.3.7. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

1.3.8. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

1.4. CONFLICTING REQUIREMENTS

1.4.1. 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 District for a decision before proceeding.

1.4.2. 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 District for a decision before proceeding.

1.5. SUBMITTALS

1.5.1. Qualification Data: For testing agencies specified in "Quality Assurance" below 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.

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

1.5.2.1. Specification number and title.

1.5.2.2. Description of test and inspection.

1.5.2.3. Identification of applicable standards, codes or regulations.

1.5.2.4. Identification of test and inspection methods.

1.5.2.5. Number of tests and inspections required.

1.5.2.6. Time schedule or time span for tests and inspections.

1.5.2.7. Entity responsible for performing tests and inspections.

1.5.2.8. Requirements for obtaining samples.

1.5.2.9. Unique characteristics of each quality-control service.

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

1.5.3.1. Date of issue.

1.5.3.2. Project title and number.

1.5.3.3. Name, address, and telephone number of testing agency.

1.5.3.4. Dates and locations of samples and tests or inspections.

1.5.3.5. Names of individuals making tests and inspections.

1.5.3.6. Description of the Work and test and inspection method.

1.5.3.7. Identification of product and Specification.

1.5.3.8. Complete test or inspection data.

1.5.3.9. Test and inspection results and an interpretation of test results.

1.5.3.10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.

1.5.3.11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Documents' requirements.

1.5.3.12. Name and signature of laboratory inspector.

1.5.3.13. Recommendations on retesting and reinspecting.

1.5.3.14. Descriptions of deficiencies noted, and corrective action undertaken to resolve such deficiencies.

1.5.3.14.1. Deficiencies observed shall immediately be brought to the attention of the Contractor's field superintendent, and trade foreman. In the event deficiencies are not corrected, or if an interpretation of the Contract Documents is required, the Testing Agency shall immediately notify the District and applicable consultant, Architect, or Engineer.

1.5.3.14.2. The Testing Agency shall maintain a deficiency list of all items not corrected and shall reinspect the area after the deficiency has been corrected. The list shall include a description of the deficiency, the date and time the deficiency was observed,

who was notified, the date of reinspection and description of any corrective action taken. Distribute the deficiency list at least once per month.

1.5.3.15.15. At the end of the Project, the Testing Agency shall submit a final signed report stating whether the work tested and inspected conforms to the Contract Documents' requirements.

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

1.6. QUALITY ASSURANCE

1.6.1. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specifications specify additional requirements.

1.6.2. 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. Where required by the individual Specifications, Installer employing workers trained and approved by manufacturer, Installer being acceptable to manufacturer, and/or Installer being an authorized representative of manufacturer for both installation and maintenance.

1.6.3. 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.

1.6.4. 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.

1.6.5. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the State of California, and who is experienced in providing engineering services of the kind indicated.

1.6.6. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.

1.6.7. Specialists: Certain Specifications may 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.

1.6.7.1. Requirement for specialists shall not supersede building codes or regulations governing the Work.

1.6.8. Testing Agency Qualifications: An NRTL, an NVLAP, Division of the State of Architect's Accepted Laboratory, or an independent agency with the experience and capability to conduct testing and inspecting indicated; and with additional qualifications stated in

individual Specifications; and where required by and acceptable to authorities having jurisdiction.

1.6.8.1. NRTL: A Nationally Recognized Testing Laboratory according to 29 CFR 1910.7.

1.6.8.2. NVLAP: A testing agency accredited according to NIST's (National Institute of Standards and Technology) National Voluntary Laboratory Accreditation Program.

1.6.8.3. Tests shall be made by an accredited testing agency with a minimum of 5 years of experience in the specific type of testing to be performed. Except as otherwise provided, sampling and testing of all materials and the laboratory methods and testing equipment shall be in accordance with the applicable standards and methods of the California Building Standards code.

1.6.8.4. For each type of inspection and testing service to be performed, the Testing Agency shall submit certification, signed and sealed by the Agency's professional engineer, of compliance with all applicable requirements of the following:

1.6.8.4.1. ASTM E329, "Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction."

1.6.8.4.2. "Recommended Requirements for Independent Laboratory Qualifications" published by the American Council of Independent Laboratories.

1.6.8.5. Furnish written certification to the District that all equipment to be used has been calibrated in accordance with applicable ASTM standards within the last year and is in proper working order.

1.6.8.6. Testing Agency Personnel Qualifications: Testing and inspection services shall be performed only by trained and experienced technicians currently qualified for the work they are to perform. Documentation of such training and experience shall be submitted to the District and/or its consultants upon request.

1.6.8.7. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the state where the Project is located.

1.6.8.8. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.6.9. Preconstruction Testing: Where a testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1.6.9.1. Contractor responsibilities include the following:

1.6.9.1.1. Verify by its Quality Assurance/Quality Control procedures that an element is ready for testing prior to requesting a test.

1.6.9.1.2. Provide test specimens representative of proposed products and construction.

1.6.9.1.3. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.

1.6.9.1.4. Provide sizes and configurations of test assemblies, mock-ups, and laboratory mock-ups to adequately demonstrate capability of products to comply with performance requirements.

1.6.9.1.5. Build site-assembled test assemblies and mock-ups using installers who will perform same tasks for Project.

1.6.9.1.6. Build laboratory mock-ups at testing facility using personnel, products, and methods of construction indicated for the completed Work.

1.6.9.1.7. When testing is complete, remove test specimens, assemblies, mock-ups, and laboratory mock-ups; do not reuse products on Project.

1.6.9.2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to District 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' requirements.

1.6.10. Mock-ups: Before installing portions of the Work requiring mock-ups, build mock-ups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1.6.10.1. Build mock-ups in location and of size indicated or, if not indicated, as directed by District or its consultant.

1.6.10.2. Notify District and its consultants seven (7) days in advance of dates and times when mock-ups will be constructed.

1.6.10.3. Demonstrate the proposed range of aesthetic effects and workmanship.

1.6.10.4. Obtain District and its consultant's approval of mock-ups before starting work, fabrication, or construction.

1.6.10.4.1. Allow seven (7) days for initial review and each re-review of each mock-up.

1.6.10.5. Incorporate seismic design of nonstructural components as listed in Division 01 Document "Seismic Design Requirements for Non-Structural Components" into mock-ups.

1.6.10.6. Maintain mock-ups during construction in an undisturbed condition as a standard for judging the completed Work.

1.6.10.7. Demolish and remove mock-ups when directed, unless otherwise indicated.

1.6.11. Laboratory Mock-Ups: Comply with requirements of preconstruction testing and those specified in individual Specifications in Divisions 02 through 49.

1.7. QUALITY CONTROL

1.7.1. District Responsibilities: Where quality-control services are indicated as District's responsibility, District will engage a qualified testing agency to perform these services.

1.7.1.1. District will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting the testing agencies are engaged to perform.

1.7.1.2. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Price will be adjusted by Change Order per the Contract Documents.

1.7.2. Tests and inspections not explicitly assigned to District 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.

1.7.2.1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform the quality-control services.

1.7.2.1.1. Contractor shall not employ same entity engaged by District, unless agreed to in writing by District.

1.7.2.2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.

1.7.2.3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.

1.7.2.4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

1.7.2.5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

1.7.3. 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 Document "Submittal Procedures."

1.7.4. 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' requirements.

1.7.5. Testing Agency Responsibilities: Cooperate with District, District's consultants, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1.7.5.1. Notify District, District's consultants, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

1.7.5.2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.

1.7.5.3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.

1.7.5.4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.

1.7.5.5. Do not release, revoke, alter, or increase the Contract Documents' requirements or approve or accept any portion of the Work.

1.7.5.6. Do not perform any duties of Contractor.

1.7.6. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify testing agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1.7.6.1. Access to the Work.

1.7.6.2. Incidental labor and facilities necessary to facilitate tests and inspections.

1.7.6.3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.

1.7.6.4. Facilities for storage and field curing of test samples.

1.7.6.5. Delivery of samples to testing agencies.

1.7.6.6. Preliminary design mix proposed for use for material mixes that require control by testing agency.

1.7.6.7. Security and protection for samples and for testing and inspecting equipment at Project Site.

1.7.6.8. Furnish tools, samples of materials, design mixes, equipment and assistance as requested.

1.7.6.9. Provide and maintain, for the sole use of the Testing Agency, adequate facilities for the safe storage and proper curing of concrete test cylinders on the project site for the first 24 hours after casting as required by ASTM C31, Method of Making and Curing Concrete Test Specimens in the Field.

1.7.6.10. Build and store masonry test prisms in a manner acceptable to the Testing Agency. Prisms to be tested shall remain at the job site until moved by Testing Agency personnel.

1.7.6.11. Notify Testing Agency at least 10 working days in advance of any qualification testing for welding required herein.

1.7.6.12. Notify Testing Agency at least 24 hours prior to expected time for operations requiring testing or inspection services.

1.7.6.13. Make arrangements with the Testing Agency and pay for additional samples and tests made for the Contractor's convenience or for retesting of failed samples.

1.7.6.14. For deficiencies requiring corrective action, submit in writing a description of the deficiency and a proposed correction to the District. After review and approval, the proposed corrective action shall be implemented and inspected by the Testing Agency. It is Contractor's responsibility to ascertain that the deficiency is corrected and inspected prior to the work being covered.

1.7.6.15. Retention of an independent Testing Agency by the District shall in no way relieve Contractor of responsibility for performing all work in accordance with the Contract Documents' requirements.

1.7.7. 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.

1.7.7.1. Schedule times for tests, inspections, obtaining samples, and similar activities.

2. PRODUCTS

2.1. GENERAL

2.1.1. Do not use any materials or equipment represented by samples until tests, if required, have been made and the materials or equipment found to be acceptable. Any product which becomes unfit for use after acceptance shall not be incorporated into the Work.

3. EXECUTION

3.1. TEST AND INSPECTION LOG

3.1.1. Prepare a record of tests and inspections. Include the following:

3.1.1.1. Date test or inspection was conducted.

3.1.1.2. Description of the Work tested and inspected.

3.1.1.3. Date test or inspection results were transmitted to District.

3.1.1.4. Identification of testing agency or special inspector conducting test or inspection.

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

3.2. REPAIR AND PROTECTION

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

3.2.1.1. Provide materials and comply with installation requirements specified in other Specifications. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.

3.2.1.2. Comply with Document "Cutting and Patching" and all related Contract Documents' requirements.

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

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

END OF DOCUMENT

SECTION 01 42 00 - REFERENCES

PART 1 **- GENERAL**

1.1 PRINCIPAL WORK IN THIS SECTION

A. The requirements of the **Owner's** General and Supplementary Conditions, and Division 0 and Division 1 general requirements apply to the work of this Section.

B. This section and related attachments are for general use and specific use as herein indicated as herein specified and as necessary to complete the work required by project conditions, including but not limited to:

1. References to:

a. Standards
b. Associations
c. Definitions
d. Abbreviations
e. Miscellaneous items are intended to provide a central location for reference.

1) This section shall provide assistance with definitions.

C. The **General Contractor** shall obtain and maintain at the project site a copy of the referenced standards as deemed necessary to complete the work.

1.2 REFERENCE STANDARDS

A. Refer to Section 01 41 00 – Regulatory Requirements

1.3 ASSOCIATIONS

A. Associations shall include, but not be limited to:

1.	AA	Aluminum Association www.aluminum.org
2.	AABC	Associated Air Balance Council
3.	AAC	Aluminum Anodizers Council
4.	AAMA	American Architectural Manufacturers Association www.aamanet.org
5.	AAN	American Association of Nurserymen
6.	AASHTO	American Association of State Highway and Transportation Officials www.transportation.org
7.	AATCC	American Association of Textile Chemists and Colorists
8.	AAU	Amateur Athletic Union
9.	ABMA	American Boiler Manufacturers Association www.abma.com
10.	ACIL	American Council of Independent Laboratories
11.	ACPA	American Concrete Pipe Association
12.	ADA/ ADAAG	Americans with Disabilities www.usdoj.gov/crt/ada/adahom1.htm Act Accessibility Guidelines www.access-board.gov
13.	ADC	Air Diffusion Council
14.	AFPA	American Forest and Paper Association
15.	AGA	American Gas Association www.aga.org

16.	AGC	Associated General Contractors of America www.agc.org
17.	AGMA	American Gear Manufacturers Association www.agma.org
18.	AHA	American Hardboard Association
19.	ACI	American Concrete Institute www.aci-int.org
20.	AHAM	Association of Home Appliance Manufacturers
21.	AI	Asphalt Institute
22.	AIA	American Institute of Architects www.aia.org
23.	AIHA	American Industrial Hygiene Association
24.	AIMA	Acoustical and Insulating Materials Association
25.	AISC	American Institute of Steel Construction www.aisc.org
26.	AISI	American Iron and Steel Institute www.**steel**.org
27.	AITC	American Institute of Timber Construction
28.	ALI	Associated Laboratories, Inc.
29.	ALSC	American Lumber Standards Committee
30.	AMCA	Air Movement and Control Association
31.	ANSI	American National Standards Institute www.ansi.org
32.	AOSA	Association of Official Seed Analysts
33.	APA	American Plywood Association www.apawood.org
34.	API	American Petroleum Institute www.api.org
35.	APWA	American Public Works Association www.apwa.net
36.	ARI	Air-Conditioning and Refrigeration Institute
37.	ARMA	Asphalt Roofing Manufacturers Association
38.	ASA	Acoustical Society of America www.asa.aip.org
39.	ASC	Adhesive and Sealant Council
40.	ASCE	American Society of Civil Engineers www.asce.org
41.	ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers www.ashrae.org
42.	ASME	American Society of Mechanical Engineers(ASME), www.asme.org
43.	ASPA	American Sod Producers Association (ASPA)
44.	ASPE	American Society of Plumbing Engineers (ASPE), www.aspe.org
45.	ASSE	American Society of Sanitary Engineering (ASSE), www.asse- plumbing.org
46.	ASTM	American Society For Testing & Materials www.astm.org
47.	ATIS	Alliance for Telecommunications Industry Solutions
48.	AWG	American Wire Gage
49.	AWI	Architectural Woodwork Institute www.awinet.org
50.	AWPB	American Wood Preservers Bureau www.awpa.com
51.	AWS	American Welding Society www.aws.org
52.	AWWA	American Water-Works Association www.awwa.org
53.	AWPA	American Wood Protection Association
54.	AWPI	American Wood Preservers Institute www.awpai.com
55.	BHMA	Builder's Hardware Manufacturers Association www.buildershardware.com
56.	BIA	Brick Industry Association
57.	BIFMA	The Business and Institutional Furniture Manufacturer's Association
58.	BSI	Building Stone Institute
59.	CAGI	Compressed Air and Gas Institute
60.	CALTrans	State of California, Department of Transportation

61.	CAUS	Color Association of the United States
62.	CBHF	Bureau of Home Furnishings and Thermal Insulation, State of California, Dept. of Consumer Affairs
63.	CBSC	California Building Standards Commission (California Code of Regulations, Title 24) www.bsc.ca.gov
64.	CBM	Certified Ballast Manufactures
65.	CCC	Carpet Cushion Council
66.	CCMTC	California Concrete Masonry Technical Committee
67.	CDA	Copper Development Association
68.	CFFA	Chemical Fabrics and Film Association, Inc.
69.	CGA	Compressed Gas Association
70.	CISCA	Ceilings & Interior Systems Construction Association www.cisca.org
71.	CISPI	Cast Iron Soil Pipe Institute
72.	CLFMI	Chain Link Fence Manufacturing Institute
73.	CPSC	Consumer Product Safety Commission
74.	CRA	California Redwood Association www.calredwood.org
75.	CRI	Carpet and Rug Institute
76.	CRSI	Concrete Reinforcing Steel Institute www.crsi.org
77.	CS	Commercial Standard
78.	CSA	Canadian Standards Association
79.	CSI	Construction Specifications Institute www.csinet.org
80.	CSSB	Cedar Shingle and Shake Bureau
81.	CTI	Ceramic Tile Institute www.ctioa.org
82.	DFPA	Douglas Fir Plywood Association now known as American Plywood Association www.apawood.org
83.	DHI	Door Hardware Institute
84.	DIPRA	Ductile Iron Pipe Research Association
85.	DLPA	Decorative Laminate Products Association
86.	DSA	Division of the State Architect www.dsa.ca.gov
87.	EIA	Electronic Industries Association
88.	EIMAEIFS	Industry Manufacturers Association
89.	EJMA	Expansion Joint Manufacturers Association
90.	ETL	Electrical Testing Laboratory
91.	FCI	Fluid Controls Institute
92.	FCICA	Floor Covering Installation Contractors Association
93.	FGMA	Flat Glass Marketing Association
94.	FM	Factory Mutual Research Corporation www.fmglobal.com
95.	FS	Federal Specifications www.fss.gsa.gov/pub/fedspecs/search.cfm
96.	FSC	Forest Stewardship Council
97.	FTI	Facing Tile Institute
98.	GA	Gypsum Association
99.	GANA	Glass Association of North America
100.	GIS	Germany Institute for Standardization
101.	HEI	Heat Exchange Institute
102.	HI	Hydronics Institute
103.	HMA	Hardwood Manufacturers Association
104.	HMMA	Hollow Metal Manufacturers Association (Division of NAAMM)

		www.naamm.org/hmma
105.	HPVA	Hardwood Plywood and Veneer Association
106.	HUD	U.S. Dept of Housing and Urban Development
107.	IAPMO	International Association of Plumbing and Mechanical Officials
108.	IBD	Institute of Business Designers
109.	ICC	International Code Council www.iccsafe.org
110.	ICC-ES	International Code Council Evaluation Service
111.	ICEA	Insulated Cable Engineers Association
112.	ICBO	International Conference of Building Officials www.iccsafe.org
113.	ICRI	International Concrete Repair Institute www.icri.org
114.	IEC	International Electro-technical Commission
115.	IEEE	Institute of Electrical and Electronics Engineers www.ieee.org
116.	IESNA	Illuminating Engineering Society of North America www.iesna.org
117.	IFAI	Industrial Fabrics Association International
118.	IGCC	Insulating Glass Certification Council
119.	ILI	Indiana Limestone Institute of America
120.	IMIAC	International Masonry Industry All-Weather Council
121.	IMSA	International Municipal Signal Association
122.	IPCEA	Insulated Power Cable Engineers Association www.icea.net
123.	IPEMA	International Play Equipment Manufacturers Association
124.	IRI	Industrial Risk Insurers
125.	ISA	Instrument Society for Measurement and Control
126.	ISO	International Standards Organization
127.	JICS	Joint Industry Conference Standards
128.	KCMA	Kitchen Cabinet Manufacturers Association
129.	LEED	Leadership in Energy and Environmental Design www.usgbc.org/LEED
130.	LIA	Lead Industries Association, Inc.
131.	LPI	Lightning Protection Institute
132.	LSGA	Laminators Safety Glass Association
133.	MBMA	Metal Building Manufacturers Association www.mbma.com
134.	MCAA	Mechanical Contractors Association of America
135.	MFMA	Maple Flooring Manufacturers Association
136.	MIA	Marble Institute of America
137.	ML/SFA	Metal Lath/Steel Framing Association (Division of NAAMM)
138.	MMSA	Materials and Methods Standards Association
139.	MSS	Manufacturer's Standardization Society of the Valve and Fitting Industry www.mss-hq.org
140.	NAA	National Arborist Association
141.	NAAMM	National Association of Architectural Metal Manufacturers www.naamm.org
142.	NAIMA	North American Insulation Manufacturers Association
143.	NAPA	National Asphalt Pavement Association
144.	NBFU	National Board of Fire Underwriters (American Insurance Assn.) www.nbfu.com
145.	NCAA	National Collegiate Athletic Association
146.	NCCA	National Coil Coaters Association www.coilcoating.org
147.	NCMA	National Concrete Masonry Association
148.	NCPI	National Clay Pipe Institute

149.	NCRPM	National Council on Radiation Protection and Measurements
150.	NCSBCS	National Conference of States on Building Codes and Standards www.NCSBCS.org
151.	NCSPA	National Corrugated Steel Pipe Association
152.	NECA	National Electrical Contractors Association
153.	NEI	National Elevator Industry, Inc. www.neii.org
154.	NEMA	National Electrical Manufacturers Association www.nema.org
155.	NES	National Evaluation Service www.icc-es.org
156.	NETA	International Electrical Testing Association
157.	NFPA	National Fire Protection Agency www.nfpa.org
158.	NHLA	National Hardwood Lumber Association
159.	NISD	National Institute of Steel Detailing www.nisd.org
160.	NIST	National Institute of Standards and Technology
161.	NLGA	National Lumber Grades Authority
162.	NOFMA	National Oak Flooring Manufacturers Association
163.	NOMMA	National Ornamental and Miscellaneous Metals Association
164.	NPA	National Particleboard Association
165.	NPCA	National Paint and Coatings Association
166.	NRB	National Research Board, Council Of American Building Officials
167.	NRCA	National Roofing contractors Association
168.	NRMCA	National Ready-Mix Concrete Association
169.	NSF	National Sanitation Foundation www.nsf.org
170.	NSSEA	National School Supply and Equipment Association
171.	NSWMA	National Sanitation and Waste Management Association
172.	NTMA	National Terrazzo and Mosaic Association
173.	NWWDA	National Wood Window and Door Association
174.	OSHA	Occupational Safety and Health Administration www.osha.gov
175.	OSHPD	Office of Statewide Health Planning and Development
176.	PATMI	Power Actuated Tool Manufacturer's Institute, Inc.
177.	PCA	Portland Cement Association www.cement.org
178.	PCI	Pre-stressed Concrete Institute www.pci.org
179.	PDCA	Painting and Decorating Contractors of America
180.	PDI	Plumbing and Drainage Institute
181.	PEI	Porcelain Enamel Institute
182.	PS	Product Standard of National Bureau of Standards
183.	RFCI	Resilient Floor Covering Institute
184.	RIS	Redwood Inspection Service
185.	RMA	Rubber Manufacturers Association
186.	SAMA	Scientific Apparatus Makers Association
187.	SDI	Steel Deck Institute
188.	SIGMA	Sealed Insulating Glass Manufacturers Association
189.	SFM	State Fire Marshal
190.	SGCC	Safety Glazing Certification Council
191.	SJI	Steel Joist Institute
192.	SMA	Screen Manufacturers Association
193.	SMA	Stucco Manufacturers Association
194.	SMACNA	Sheet Metal and Air Conditioning Contractors, Association www.smacna.org

195.	SPIB	Southern Pine Inspection Bureau
196.	SPR	Simplified Practice Recommendation
197.	SPRI	Single-Ply Roofing Institute
198.	SSMA	Steel Stud Manufacturers Association www.ssma.com
199.	SSPC	Steel Structures Painting Council www.sspc.org
200.	SSPMA	Sump and Sewage Pump Manufacturers Association
201.	STI	Steel Tank Institute
202.	SWI	Steel Window Institute
203.	SWPA	Submersible Wastewater Pump Association
204.	SWRI	Sealant, Waterproofing and Restoration Institute www.swrionline.org
205.	SWRCB	California Environmental Protection Agency, State Water Resources Control Board Water Quality (Stormwater Prevention Plan)
206.	TCNA	The Tile Council of North America, Inc. www.tileusa.com
207.	TIMA	Thermal Insulation Manufacturers Association
208.	TPI	Truss Plate Institute
209.	UL	Underwriters Laboratories, Inc. www.ul.com
210.	UNI	Uni-Bel PVC Pipe Association
211.	USGBC	United States Green Build Council
212.	USP	United States Pharmacopoeial Convention
213.	USPHS	United States Public Health Service www.usphs.gov
214.	USDA	United States Department of Agriculture
215.	USTC & TBA	United States Tennis Court and Track Builders Association
216.	VWDI	Vinyl Window and Door Institute
217.	WA	Wall Coverings Associations
218.	WCLIB	West Coast Lumber Inspection Bureau www.wclib.com
219.	WCMA	Window Covering Manufacturers Association
220.	WCRSI	Western Concrete Reinforcing Steel Institute
221.	WH	Warnock Hersey International, Inc.
222.	WI	Woodwork Institute
223.	WLPDIA	Western Lath, Plaster, Drywall Industries Association
224.	WPS	Welding Procedures Specifications
225.	WRI	Wire Reinforcement Institute
226.	WSC	Water Systems Council
227.	WSFI	Wood and Synthetic Flooring Institute
228.	WWPA	Western Woods Product Association www.wwpa.org
229.	W.I.	Woodwork Institute Manual of Millwork www.woodworkinstitute.com

1.4 DATES OF STANDARDS

A. Except where a specific date of issue is mentioned herein, references to specifications issued by the above named and other organizations shall mean the edition current on the date of the issuance of project permit.

1.5 DEFINITIONS

A. The following are used in specifications and documents in addition to Division 1 as herein defined:

1. Accepted Equal or Accepted Equivalent:

a. Reviewed and accepted by the **Architect** as being equal in quality, utility and appearance and within the Design Intent of the documents, but shall not in any way change or delete the original intent of the documents.

2. Approved:
   a. As accepted by the **Architect**, (shop drawings & Submittals shall be reviewed for design intent but shall not be approved.
      1. Does not include review for items changed but not specifically noted by **Contractor**.
3. Approved Equal / Approved Equivalent:
   a. As accepted by the **Architect**, (shop drawings & Submittals shall be reviewed for design intent but shall not be approved.
      1. Does not include review for items changed but not specifically noted by **Contractor**.
4. As Required:
   a. As required by referenced standards, existing project conditions, Contract Documents or regulatory requirements.
5. Directed:
   a. As instructed by the **Architect** and/or **Owner** in writing.
6. Documents:
   a. Includes:
      1. Drawings
      2. Project Manual/Specifications
      3. Owner/Contractor Contract
      4. Addendums
      5. Supplemental Documents in accordance with project manual / specifications.
7. Drawings:
   a. Drawn representation of the scope of work.
8. Furnish (materials):
   a. To supply and deliver to the project site in new condition ready for installation and in operable and new condition.
9. Geotechnical Engineer
   a. A **Civil** or **Geotechnical Engineer** licensed in the State of California, who is retained and paid by the **Owner** to perform services as specified in the Contract Documents.
10. Indicated:
    a. As shown, noted on the drawings and/or specifications or scheduled in the drawings.
11. Install (service or labor):
    a. Anchor, fabricate, connect and/or fasten in place and adjust for use and/or place or apply in proper position & location and/or establish in place for use or service.

b. To place in final position, complete, anchored, connected, and in operable condition with respect to required codes and/or governing agency requirements.

12. Project Manual:
    a. Is the volume which includes the; Bidding Requirements, Contract Forms, Conditions of the Contract and the Specifications.
13. Provide:
    a. To furnish, install and fabricate complete.
14. Shall:
    a. To be construed as 'mandatory'.
15. Site:
    a. Area to be occupied by the Project.
    b. Any portion directly outside exterior face of exterior walls.
16. Similar:
    a. Shall be interpreted in its general sense and not as necessarily meaning identical, and all details shall be worked out in relationship to their location and to their connection with other parts of the work.
17. Owner:
    a. The Owner of the project, or their authorized agent / on-site representative.
18. Testing Agency:
    a. An organization other than the Testing Laboratory retained and paid by the **Contractor** to perform tests and reports on whether or not designated items of Work comply with the requirements of the Contract Documents.
19. Testing Laboratory:
    a. An independent commercial testing organization, retained and paid by the **Owner** to perform tests and report on Work as specified in the Contract Documents, and as otherwise required.
        1. **General Contractor** shall pay for Testing when they have not provided the appropriate time prior to testing being required to be done.

1.6 ABBREVIATIONS

A. The following is a reference list including basic abbreviations included in Project manual and/or drawings including, but not limited to;
    1. Refer also to drawings and individual specifications for additional abbreviations.

&	and
L	Angle
@	at
CL	Centerline
Ø	Diameter

#	Number
(E)	Existing
(F)	Future
(N)	New
ACOUST	Acoustical
ACP	Asphalt Concrete Paving
ADA	Americans with Disabilities Act
ADDL	Additional
ADO	Automatic Door Opener
ADJ	Adjustable
A.F.F.	Above Finish Floor
A.F.G.	Above Finish Grade
AGGR	Aggregate
ALUM	Aluminum
APPROX	Approximate
ARCH	Architectural
ASSY	Assembly
AV	Audio Visual
BD	Board
BITUM	Bituminous
BKG	Backing
BLDG	Building
BLKG	Blocking
BM	Beam
BMP	Best Management Practices
B.O.	Bottom of / Back of
BR	Backer Rod
BTWN	Between
CAB	Cabinet
CASAM	Cold Applied Self Adhering Waterproof Membrane
CBC	California Building Code
CFCI	Contractor Furnished Contractor Installed
CFOI	Contractor Furnished Owner Installed
CJ	Control Joint
CLG	Ceiling
CLR	Clear
CMU	Concrete Masonry Unit
CNTR	Counter
C.O.	Cased Opening
COL	Column
CONC	Concrete
CONT	Continuous

CORR	Corridor
CR	Card Reader
CTR	Center
CTSK	Countersunk
CUST	Custodial
CW	Cold Water
DBL	Double
DEG	Degree
DEPT	Department
DF	Drinking Fountain
DIA	Diameter
DIM	Dimension
DISP	Dispenser
DN	Down
D.O.	Door Opening
DR	Door
DS	Downspout
DTL	Detail
DWG	Drawing
E	East
EA	Each
EJ	Expansion Joint
EL	Elevation
ELEC	Electrical
ELEV	Elevator
EMER	Emergency
ENCL	Enclosure
EQ	Equal
EQUIP	Equipment
ETC	Et Cetera
EW	Each Way
EXP	Expansion
EXT	Exterior
FA	Fire Alarm
FD	Floor Drain
FND	Foundation
FE	Fire Extinguisher and Bracket Mount with Signage
FEF	Fire Extinguisher and Fully Recessed Cabinet with Signage
FES	Fire Extinguisher and Semi- Recessed Cabinet with Signage

F.F.	Finish Floor
FIN	Finish
FHC	Fire Hose Cabinet
FLG	Flooring
FLR	Floor
FM	Floor Mounted
F.O.	Face of
FRP	Fiber Reinforced Plastic
FT	Foot or Feet
FTG	Footing
FURR	Furring
FURN	Furniture
GA	Gauge
GALV	Galvanized
GC	General Contractor
GD	Garbage Disposal
GLB	Glue Laminated Beam
GR	Grade
GSM	Galvanized Sheet Metal
GYP	Gypsum
HB	Hose Bibb
HC	Hollow Core
HDWR	Hardware
HT	Height
HM	Hollow Metal
HOR	Horizontal
HVAC	Heating, Ventilating, and Air Conditioning
I.D.	Inside Diameter
i.e.	Example
INSUL	Insulation
INT	Interior
IOR	Inspector of Record
IT	Information Technology
JT	Joint
KIT	Kitchen
LAB	Laboratory
LAM	Laminate
LAV	Lavatory
LT	Light / Lighting

LTWT	Lightweight
LVL	Laminated Veneer Lumber
MATL	Material
MAX	Maximum
MECH	Mechanical
MFGR	Manufacturer
MIN	Minimum
MISC	Miscellaneous
M.O.	Masonry Opening
MTD	Mounted
MTL	Metal
N	North
N/A	Not Applicable
NIC	Not in Contract
NOM	Nominal
NTS	Not To Scale
O/	Over
O.C.	On Center
O.D.	Outside Diameter
OF	Overflow
OFCI	Owner Furnished Contractor Installed
OFOI	Owner Furnished Owner Installed
OPNG	Opening
OPP	Opposite
PLAM	Plastic Laminate
PL	Plate
PLYWD	Plywood
PR	Pair
PROP	Property
PSF	Pounds per Square Foot
PSI	Pounds per Square Inch
PSL	Parallel Strand Lumber
PT	Pressure Treated
PV	Photovoltaic
RAD	Radius
RD	Roof Drain
REF	Reference
REFR	Refrigerator
REINF	Reinforcement/Reinforcing
REQD	Required

RM	Room
R.O.	Rough Opening
RWL	Rain Water Leader
S	South
SAABM	Spray Applied Air Barrier Membrane
SCHED	Schedule
SF	Square Foot/Feet
SHTG	Sheathing
SHWR	Shower
SIM	Similar
SMS	Sheet Metal Screws
SPEC	Specification
SS	Stainless Steel
STD	Standard
STL	Steel
STOR	Storage
STRL	Structural
T	Tread
TBD	To Be Determined
TEL	Telephone
TEMP	Temporary
T&G	Tongue and Groove
T.O.	Top of
TS	Tube Steel
TV	Television
TYP	Typical
UC	Under Counter
UL	Underwriters Laboratory
UON	Unless Otherwise Noted
VERT	Vertical
VEST	Vestibule
VIF	Verify in Field
W	West
W/	With
WC	Water Closet
WDW	Window
WH	Water Heater
W.O.	Where Occurs
W/O	With Out
WRB	Water Resistant Barrier

WT	Weight

1.7 MISCELLANEOUS REQUIREMENTS

A. Prior Use or Occupancy

1. Refer to Division 1 for closeout submittal procedures.

B. Lines &Levels

1. Before starting work, locate all general reference points.
    a. Take such steps as are necessary to prevent their dislocations or destruction.
    b. If disturbed or destroyed, replace as directed.
    c. Employ competent surveyor to lay out work; be responsible for its accuracy.

C. As-Built – Record Drawings

1. Scope of contractors responsibilities, refer to, but not limited to:
    a. Individual specification sections.
    b. Division 1 – General Requirements
    c. Refer to Division 1 for substitution, deviation and/or submittal procedures.
    d. Refer to Division 1 for closeout submittal procedures.

D. Workmanship

1. Refer to individual specification sections
2. Refer to Division 1 general requirements
3. Refer to Division 1 for quality control requirements.
4. All work involved in this project shall reflect the best possible workmanship.
    a. Any work which is not of the best workmanship shall be corrected or redone as is required for approval by the **Architect**, at no additional cost to the **Owner**.
5. No trade should apply any finishes or materials to any surfaces until they feel that the surfaces are ready to receive the finish or material and produce the best possible workmanship.
    a. Any trade who does apply the finish or materials to surfaces that are not ready shall remove and correct their work as well as prepare the existing surfaces involved at no additional cost to the **Owner**.

E. Vendor and Sub-Contractors

1. **General Contractor** shall provide **Architect** with a complete list of subcontractors and principal vendors including addresses and telephone numbers. List each under heading of subcontractor category and/or vendor type.
2. The **General Contractor** is responsible for determination and coordination of union and/or non-union project affiliation.
    a. **General Contractor** shall prepare and adhere to the Contract Construction Schedule based on required Contract time of completion. In the event of termination by parties hereto, all work performed and materials furnished shall be fairly allocated and apportioned in accordance with good construction practices.

F. Termination by **Owner**

1. Refer to but not limited to; General Conditions.

G. Warranties:

1. Refer to individual specification sections.
2. Refer to Division 1 for closeout submittal procedures.

H. Maintenance Manuals:

1. Refer to individual specification sections.
2. Refer to Division 1 for closeout submittal procedures.

I. Other items not herein listed;

1. Refer to but not limited to:

a. Refer to Division 1 for closeout submittal procedures.

PART 2 **- PRODUCTS**
Not used

PART 3 **- EXECUTION**
Not used

END OF SECTION 01 42 00

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SECTION 01 45 00 – QUALITY CONTROL

PART 1 **- GENERAL**

1.1 PRINCIPAL WORK IN THIS SECTION

A. The requirements of the **Owner's** General and Supplementary Conditions, and Division 0 and Division 1 general requirements apply to the work of this Section.

B. Coordinate the work of this Section with all trades.

C. Verify applicable dimensions, clearances and heights at the jobsite.

D. Furnish materials and perform labor required to execute this work as indicated on the drawings, as specified herein and as necessary to complete the work required by project conditions, including but not limited to:

1. Control quality of installation of materials & systems.
2. Control quality of construction.
3. Control quality of site demolition.

1.2 REFERENCE STANDARDS

A. 2022 California Code of Regulations (CCR), Title 24, California Building Standards Commission (CBSC) www.bsc.ca.gov current edition at time of permit issuance.

B. Title 24, California Code of Regulations, California Building Standards Commission.

C. ATBCB ADAAG - Americans with Disabilities Act Accessibility Guidelines, current version.

D. CBC Energy Code, California Code of Regulations, Title 24, Part 6, California Building Standards Commission.

E. Title 24, Chapter 11 – California Green Building Standards Code

1. Non-residential new construction:

a. All occupancy types.

F. Leadership in Energy and Environmental Design (LEED), www.usgbc.org/LEED (United States Green Building Council (USGBC)
Refer to Division 1 for version of LEED Rating System and Reference Guide applicable to project.

G. Collaborative for High Performance Schools (CHPS), www.chps.net

1.3 PERFORMANCE, TESTING AND INSPECTION

A. General:

1. Comply with manufacturer's standards.
2. Comply with Building Code.
3. Job site inspections shall be done as herein specified and as listed in drawings.
4. Testing shall be done as herein specified and as listed in drawings.
5. Comply with requirements of specific Specification Section and/or Drawings.

1.4 SUBMITTALS AND MOCK-UPS

A. Refer to Division 1 for substitution, deviation and/or submittal procedures.

1. Coordinate with each specific Specification Section.

B. Refer to Division 1 for sustainability requirements.

C. Mock-ups:

1. Shall be reviewed and approved in field by **Architect**.

1.5 QUALITY ASSURANCE

A. Refer as herein indicated and as indicated in each specific Specification Section.

B. Hazardous materials:

1. It is illegal to manufacture, sell or use products containing asbestos in the United States.

a. These specifications rely on the product manufacturers and distributors to insure that the products they manufacture and/or distribute comply with all statutes and regulations governing their products.
b. It is understood that there has not been any testing or inspection done to confirm any hazardous materials of the specified products to confirm compliance with these statutes and regulations by the **Architect**.
c. Therefore, these specifications are done not knowingly including any specified products or materials which contain asbestos and/or any other hazardous material.
d. Any materials suspected of containing hazardous materials shall be brought to the attention of **Owner**.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Refer to Division 1 for product delivery, storage and handling requirements.

1.7 JOB CONDITIONS

A. Refer as indicated in each specific Specification Section.

B. Field-verify that all components, substrates, backing, mock-ups, etc. provided by others are installed correctly before proceeding with installation of products as herein specified.

1.8 PROTECTION

A. Protect finish surfaces at all times during testing.

1.9 RELATED WORK/SECTIONS

A. Related work includes, but is not limited to the following:

1. Project construction.
2. Project site demolition.
3. Testing & inspection by others.

B. Related Sections include, but are not limited to the following:

1. Division 1.

2. All Drawings and Specification Sections.

1.10 SEQUENCING AND SCHEDULING

A. **General Contractor** shall schedule all testing & inspections and coordinate attendance by **Architect**, **Owner,** and others.

B. Schedule required testing, prior to the installation of materials, components, etc.

C. **General Contractor** shall coordinate slab vapor emission and PH testing of concrete floors and ensure that concrete treatment within criteria of finish flooring is complete prior to the installation of finish flooring as herein specified; refer to Section 07 28 00 – Concrete Slab Vapor Emission and Alkalinity Control Treatment.

1.11 TESTING AND INSPECTIONS

A. Testing required by Testing Agent / Testing Agency shall be done in accordance with Division 1 Testing Laboratory service requirements and as indicated in the Contract Documents.

B. Testing required by **General Contractor** shall be done in accordance with this Section and each specific Specification Section requiring field testing and/or inspection.

C. Geotechnical Engineer:

1. Services of a **Geotechnical Engineer** are required for Work specified in various individual Specification Sections and/or as indicated in drawings and Division 1 Testing Laboratory service requirements.

1.12 GENERAL SYSTEM DESCRIPTION

A. Observation and Supervision:

1. The **Architect** and **Owner** or their appointed representatives will review the Work for design intent at appropriate stages, and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review.

a. **Owner**:

1) The **Owner** shall have access to the Work wherever it is in preparation or progress for ascertaining that work is in accordance with the Contract Documents. The **General Contractor** shall provide facilities, hard hats, and access and shall provide assistance for sampling or measuring materials.
2) The **Owner** will notify the **Architect** and **Engineers of Record**, and call to the **General Contractor's** attention all observed failure of work and/or material not conforming to Contract Documents.

b. **General Contractor**:

1) Shall comply with all requirements of the Contract Documents (Drawings, Specifications, **Owner's** General Conditions and Owner–General Contractor Contract). He shall supervise and direct the Work and maintain a competent superintendent on the job who is authorized to act in all matters pertaining to the Work. The **General Contractor's** superintendent shall also inspect all materials as they arrive for

compliance with the Contract Documents. He shall reject defective work or materials immediately upon performance or delivery.

B. Geotechnical Engineer services:

1. Refer to Division 1 for Testing Laboratory service requirements.

C. Testing Laboratory services:

1. Refer to Division 1 for Testing Laboratory service requirements.

D. Field testing not done under Division 1:

1. By **General Contractor** as required per Drawings and or Specifications.

E. Inspections:

1. Done by product and/or system manufacturer's approved representative for products/systems requiring Inspections.

F. Observations:

1. Done by product and/or system manufacturer's approved representative for products/systems requiring observations for general compliance.

G. Mock-ups:

1. Reviewed for acceptance by **Architect** and **Owner** as indicated in specific Specification Sections.

H. Mock-ups

1. Reviewed for acceptance by **Architect** and **Owner** as indicated in specific Specification Sections.

1.13 MAINTENANCE

A. Refer to each specific Specification Section for which products and/or assemblies will require follow-up maintenance and/or adjustment after project is complete and has been occupied for a given period of time.

PART 2 **– PRODUCTS**
Not Used

PART 3 **- EXECUTION**

3.1 INSPECTION/EXAMINATION

A. Verification of Conditions:

1. Examine areas and conditions under which work is to be performed.
2. Identify conditions detrimental to proper or timely completion of work and coordinate with **General Contractor** to rectify.

3.2 COORDINATION

A. Refer to Division 1 for project coordination requirements.

B. **General Contractor** shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

3.3 TESTING, INSPECTIONS AND OBSERVATIONS

A. General

1. Product manufacturer inspections and observations shall be done by authorized representative & observed by **General Contractor**.
2. The **General Contractor** shall be responsible for scheduling all required tests and inspections.
    a. Notify the **Owner** and **Architect** 48 hours in advance of scheduled performance of any work requiring testing or inspection.
3. The **General Contractor** shall provide access to Work to be tested, facilitate inspections, observations, tests and furnish incidental labor and facilities.
4. The **General Contractor** shall orchestrate inspections of work performed, and construction of mock-ups with **Architect** and **Owner**.
5. Re-Inspection & Testing
    a. The **General Contractor** shall pay for:
        1) Tests of materials, inspections, and certifications required by Specifications.
        2) Testing, adjusting, and balancing of equipment and systems required by Specifications.
        3) Re-tests or re-inspections, if required, and tests or inspections required to established Contractor error or missing test data required by Specifications.
        4) Uncovering of work in accordance with Division 1 cutting and patching requirements.
        5) Additional tests directed by the **Architect** or **Owner** which establish that materials and installation do not comply with the Contract Document.
6. Testing & Inspection Reports and Certifications
    a. A copy of each **General Contractor** provided testing, inspection, observation report or certification shall be provided to each of the following:
        1) **Owner**
        2) **Architect**
        3) **General Contractor**

B. General Contractor testing shall be done in accordance with individual Specification Sections and manufacturer's requirements.

3.4 PROTECTION AND CLEAN UP

A. Refer to Division 1 for protection and cleaning requirements.

B. **General Contractor** shall keep the work areas in a clean and safe condition so their testing and inspection services do not interfere with the work of others.

C. **General Contractor** shall protect work and materials of others testing and protect the installed work and materials of other trades.

D. Perform testing in accordance with listed requirements, industry standards and also as indicated in drawings and other specification sections.

E. In the event of damage, immediately make all repairs and replacements necessary to the approval of the **Architect** and at no cost to the **Owner**.

F. After completion of work in this section, remove all equipment and implements of service, and debris.

1. Leave entire area in a neat, clean, acceptable condition.

END OF SECTION 01 45 00

DOCUMENT 01 50 00

TEMPORARY FACILITIES AND CONTROLS

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Site Standards; and

1.1.5. Temporary Tree and Plant Protection.

1.2. TEMPORARY UTILITIES

1.2.1. **Electric Power and Lighting**:

1.2.1.1. Contractor will furnish and pay for power during the course of the work to the extent power is not in the building(s) or on the Site. Contractor shall be responsible for providing temporary facilities required on the Site to point of intended use.

1.2.1.2. Contractor shall furnish, wire for, install, and maintain temporary electrical lights wherever it is necessary to provide illumination for the proper performance and/or observation of the Work: a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work.

1.2.1.3. Contractor shall be responsible for maintaining existing lighting levels in the Project vicinity should temporary outages or service interruptions occur.

1.2.2. **Heat and Ventilation**:

1.2.2.1. Contractor shall provide temporary heat to maintain environmental conditions to facilitate progress of the Work, to meet specified minimum conditions for the installation and curing of materials, and to protect materials and finishes from damage due to improper temperature and humidity conditions. Portable heaters shall be standard units complete with controls.

1.2.2.2. Contractor shall provide forced ventilation and dehumidification, as required, of enclosed areas for proper installation and curing of materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors, and gases.

1.2.2.3. Contractor shall pay the costs of installation, maintenance, operation, and removal of temporary heat and ventilation, including costs for fuel consumed, required for the performance of the Work.

1.2.3. **Water**:

1.2.3.1. Contractor will furnish and pay for water during the course of the work. Contractor shall be responsible for providing temporary facilities required.

1.2.3.2. Contractor shall make potable water available for human consumption.

1.2.4. **Sanitary Facilities**:

1.2.4.1. Contractor shall provide sanitary temporary facilities in no fewer numbers than required by law and such additional facilities as may be directed by the Inspector for the use of all workers. The facilities shall be maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by the District or Contractor completes all Work.

1.2.4.2. Use of toilet facilities in the Site shall not be permitted except by consent of the Project Inspector and District.

1.2.5. **Telephone Service**:

1.2.5.1. Contractor shall arrange with local telephone service company for telephone service for the performance of the Work. Contractor shall, at a minimum, provide in its field office one line for telephone and one line for fax machine.

1.2.5.2. Contractor shall pay the costs for telephone and fax lines installation, maintenance, service, and removal; for Construction Site Office, Construction Manager's Office and Inspector's Office.

1.2.6. **Fire Protection:**

1.2.6.1. Contractor shall provide and maintain fire extinguishers and other equipment for fire protection. Such equipment shall be designated for use for fire protection only and shall comply with all requirements of the California Fire, State Fire Marshall and/or its designee.

1.2.6.2. Where on-site welding and burning of steel is unavoidable, Contractor shall provide protection for adjacent surfaces.

1.2.7. **Trash Removal:**

1.2.7.1. Contractor shall provide trash removal on a timely basis from all Site Offices and throughout the Site.

1.2.8. **Temporary Facilities:**

1.2.8.1. Contractor shall provide sufficient space and facilities for its own force's needs.

1.2.8.2. In addition, unless otherwise indicated in the Contract Documents, Contractor shall provide the following facilities, trailers, offices, furniture and:

1.2.8.2.1. One (1) 12X60 office trailer with two (2) offices for two (2) District representatives, with bathroom, common space between both offices;

1.2.8.2.2. One (1) 12X20 Project Inspector's Trailer/Office;

1.2.8.2.3. Basic furniture: chair, desks, plan table, conference room table, and chairs; and

1.2.8.2.4. Basic services: fixed line for phone, fax, and high speed internet service.

1.3. CONSTRUCTION AIDS

1.3.1. **Plant and Equipment:**

1.3.1.1. Contractor shall furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment; and for conveyances for transporting workmen. Include elevators, hoists, debris chutes, and other equipment, tools, and appliances necessary for performance of the Work.

1.3.1.2. Contractor shall maintain plant and equipment in safe and efficient operating condition. Damages due to defective plant and equipment, and uses made thereof, shall be repaired by Contractor at no expense to the District.

1.3.2. No District tools or equipment shall be used by Contractor or its subcontractors for the performance of the Work.

1.4. BARRIERS AND ENCLOSURES

1.4.1. Contractor shall obtain District's written permission for locations and types of temporary barriers and enclosures, including fire-rated materials proposed for use, prior to their installation.

1.4.2. Contractor shall provide a six (6) foot high, chain link perimeter fence with posts driven into the ground and fabric screen as a temporary barrier around construction area. Contractor shall provide and maintain temporary enclosures to prevent public entry and to protect persons using other buildings and portions of the Site and/or Premises. Contractor shall remove temporary fence, barriers and enclosure upon Completion of the Work.

1.4.3. Contractor shall provide site access to existing facilities for persons using other buildings and portions of the Site, for the public, and for deliveries and other services and activities.

1.5. SECURITY

Contractor shall secure all construction equipment, machinery and vehicles, park and store only within fenced area, and render inoperable during non-work hours. Contractor is responsible for ensuring that no construction materials, tools, equipment, machinery or vehicles can be used for unauthorized entry or other damage or interference to activities and security of existing facilities adjacent to and in the vicinity of the Project Site.

1.6. TEMPORARY CONTROLS

1.6.1. **Noise Control**:

1.6.1.1. Contractor acknowledges that adjacent facilities may remain in operation during all or a portion of the Work, and Contractor shall take all reasonable precautions to minimize noise as required by applicable laws and the Contract Documents.

1.6.1.2. Notice of proposed noisy operations, including without limitation, operation of pneumatic demolition tools, concrete saws, and other equipment, shall be submitted to District a minimum of forty-eight (48) hours in advance of their performance.

1.6.2. **Noise and Vibration**:

1.6.2.1. Equipment and impact tools shall have intake and exhaust mufflers.

1.6.2.2. Contractor shall cooperate with District to minimize and/or cease the use of noisy and vibratory equipment if that equipment becomes objectionable by its longevity.

1.6.3. **Dust and Dirt**:

1.6.3.1. Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities.

1.6.3.2. Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.

1.6.3.3. Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinance.

1.6.3.4. Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

1.6.4. **Surface and Subsurface Water:**

Contractor shall not permit surface and subsurface water, and other liquids, to accumulate in or about the vicinity of the Premises. Should accumulation develop, Contractor shall control the water or other liquid, and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods.

1.6.5. **Pollution**:

1.6.5.1. No burning of refuse, debris, or other materials shall be permitted on or in the vicinity of the Premises.

1.6.5.2. Contractor shall comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of the Work including, without limitation, demolition, construction, and disposal operations.

1.6.6. **Lighting**

If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

1.7. JOB SIGN(S)

1.7.1. **General:**

1.7.1.1. Contractor shall provide and maintain and locate a Project identification sign with the design, text, and colors designated by District and/or the Architect.

1.7.1.2. Signs other than the specified Project sign and or signs required by law, for safety, or for egress, shall not be permitted, unless otherwise approved in advance by the District.

1.7.2. **Materials:**

1.7.2.1. Structure and Framing: Structurally sound, new or used wood or metal; wood shall be nominal 3/4-inch exterior grade plywood.

1.7.2.2. Sign Surface: Minimum 3/4-inch exterior grade plywood.

1.7.2.3. Rough Hardware: Galvanized.

1.7.2.4. Paint: Exterior quality, of type and colors selected by the District and/or the Architect.

1.7.3. **Fabrication:**

1.7.3.1. Contractor shall fabricate to provide smooth, even surface for painting.

1.7.3.2. Size: 4'-0" x 8'-0", unless otherwise indicated.

1.7.3.3. Contractor shall paint exposed surfaces of supports, framing, and surface material with exterior grade paint: one coat of primer and one coat of finish paint.

1.7.3.4. Text and Graphics: As indicated.

1.8. PUBLICITY RELEASES

Contractor shall not release any information, story, photograph, plan, or drawing relating to information about the Project to anyone, including press and other public communications medium, including, without limitation, on website(s).

END OF DOCUMENT

DOCUMENT 01 52 10

SITE STANDARDS

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS:

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions, including without limitation, Site Access, Conditions, and Regulations;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Drug-Free Workplace Certification;

1.1.5. Tobacco-Free Environment Certification;

1.1.6. Criminal Background Investigation/Fingerprinting Certification; and

1.1.7. Temporary Facilities and Controls.

1.2. REQUIREMENTS OF THE DISTRICT

1.2.1. **Drug-Free Schools and Safety Requirements:**

1.2.1.1. All school sites and other District Facilities have been declared “Drug-Free Zones.” No drugs, alcohol, smoking or the use of tobacco products are allowed at any time in any buildings, Contractor-owned vehicles or vehicles owned by others while on District property. No students, staff, visitors, or contractors are to use drugs on these sites.

1.2.1.2. Contractor shall post: "Non-Smoking Area" in a highly visible location on Site. Contractor may designate a smoking area outside of District property within the public right-of-way, provided that this area remains quiet and unobtrusive to adjacent neighbors. This smoking area must be kept clean at all times.

1.2.1.3. Contractor shall ensure that no alcohol, firearms, weapons, or controlled substances enter or are used at the Site. Contractor shall immediately remove from the Site and terminate the employment of any employee(s) found in violation of this provision.

1.2.2. **Language**: Unacceptable and/or loud language will not be tolerated, "Cat calls" or other derogatory language toward students or public will not be allowed.

1.2.3. **Disturbing the Peace (Noise and Lighting):**

1.2.3.1. Contractor shall observe the noise ordinance of the Site at all times including, without limitation, all applicable local, city, and/or state laws, ordinances, and/or regulations regarding noise and allowable noise levels.

1.2.3.2. The use of radios, etc., shall be controlled to keep all sound at a level that cannot be heard beyond the immediate area of use. District reserves the right to prohibit the use of radios at the Site, except for handheld communication radios.

1.2.3.3. If portable lights are used after dark, the lights must be located so as not to direct light into neighboring properties.

1.2.4. **Traffic**:

1.2.4.1. Driving on the Premises shall be limited to periods when students and public are not present. If driving or deliveries must be made during the school hours, two (2) or more ground guides shall lead the vehicle across the area of travel. In no case shall driving take place across playgrounds or other pedestrian paths during recess, lunch, and/or class period changes. The speed limit on-the Premises shall be five (5) miles per hour (maximum) or less if conditions require.

1.2.4.2. All paths of travel for deliveries, including without limitation, material, equipment, and supply deliveries, shall be reviewed and approved by District in advance. Any damage will be repaired to the pre-damaged condition by the Contractor.

1.2.4.3. District shall designate a construction entry to the Site. If Contractor requests, District determines it is required, and to the extent possible, District shall designate a staging area so as not to interfere with the normal functioning of school facilities. Location of gates and fencing shall be approved in advance with District and at Contractor's expense.

1.2.4.4. Parking areas shall be reviewed and approved by District in advance. No parking is to occur under the drip line of trees or in areas that could otherwise be damaged.

1.2.4.5. All of the above shall be observed and complied with by the Contractor and all workers on the Site. Failure to follow these directives could result in individual(s) being suspended or removed from the work force at the discretion of the District. The same rules and regulations shall apply equally to delivery personnel, inspectors, consultants, and other visitors to the Site.

END OF DOCUMENT

SECTION 01 5813 – TEMPORARY CONSTRUCTION SIGNAGE

PART 1 - **GENERAL**

1.1 PRINCIPAL WORK IN THIS SECTION

A. The requirements of the **Owner's** General and Supplementary Conditions, and Division 0 and Division 1 general requirements apply to the work of this Section.

B. Coordinate the work of this Section with related trades.

C. Verify applicable dimensions at the job site for placement of temporary signage.

D. Wood framing, including posts, sheathing.

E. Finishing, including painting of substrate and letters and numerals for signage.

F. Framing hardware.

G. Concrete Footings with integral gravel base.

H. Disposal of sign assembly after **Owner** occupation of building.

1.2 QUALITY ASSURANCE

A. Lumber and plywood source quality control: Provide materials graded under one of the following:

1. Rules 17, Standard Grading Rules for West Coast Lumber, current edition - WCLIB.
2. Standard Grading Rules for Western Lumber, current edition - WWPA.
3. Plywood Specification and Grade Guide of American Plywood Association, current edition - APA.

B. Grade mark each piece of lumber. Marking must be done by recognized agency. Lumber Manufacturer's Association Certificates may be accepted in lieu of such grade and trademarks.

C. Plywood sheathing: Each panel shall be legibly identified as to type, grade and species by APA grade, comply with PS-1 (ANSI A199.1).

1.3 SUBMITTALS

A. Refer to Division 1 for substitution, deviation and/or submittal procedures.

B. List of materials: Submit list of materials proposed to be used including posts, sheathing & hardware.

C. Submit: Shop drawings of sign & anchorage. Sign layout shall indicate character sizes, style & spacing, type.

1.4 PRODUCT HANDLING

A. Comply with pertinent provisions of Division 1 product delivery, storage and handling requirements.

B. Provide, ship to project site, and install.

PART 2 - **PRODUCTS**

2.1 FRAMING LUMBER

A. Lumber: Coast Region Douglas Fir (DF), unless otherwise noted. Lumber designated DF South by WWPA not acceptable. All lumber new with no re-use.

1. Grades not less than following:

a. Posts: No. 1, Pressure treated Douglas fir - free of heart center.
b. Plywood: Group II Exterior APA 303 Siding EXT, Smooth Face.

B. All wood other then plywood shall be pressure treated, per building code, Chapter 23 and shall bear an AWPB stamp for P.T.D.F.

1. Wood posts set into ground.

a. Treat all cut ends of P.T.D.F. with approved preservative.

2.2 ROUGH HARDWARE

A. FASTENERS: Galvanized for exterior use, in accordance with ASTM A153. Select fasteners for the fastening of the plywood substrate sign to the support posts.

1. Standard bolts and nuts: Carriage head type, ASTM A307, Grade A.
2. Plain washers: Round, general assembly grade carbon steel, FS FF-W-92.
3. Lock washers: Helical spring type carbon steel, FS FF-W-84.

2.3 SIGNAGE DESIGN

A. General

1. Size of sign panel: 4'-0" x ¾" thick x 8'-0" long
2. Supporting Posts: 4" x 4" x 10'-0"

B. Sign design:

1. General:

a. Refer to Drawings detail.

2. Characters:

a. Style: Helvetica
b. Type: Capitals
c. Border: Install characters, logos, etc. such that an equal clear border of 2" occurs around perimeter.
d. Character height::

1. Project Name: 4" tall x two lines & spaced to span sign width
2. Project Address: 3" tall x full width of sign less perimeter clearance
3. **Owner**, **Architect** & **General Contractor** name: 2" tall
4. **Owner**, **Architect** & **General Contractor** address: 1-1/2" tall

e. Line spacing:

1. 1" between name & address, type.
2. Equally spaced between Project name/address & **Owner** name/address, etc.

3. Color:

a. Background: ICI, 473, Autumn Squash, MP# 10YY 46/515
b. Characters: Jet Black
c. Misc: Install 1/4" dots spaced at 2"+/- on center below Williams + Paddon... name. Red, PPG Color no: 71654
d. Paint Type: Alkyd Enamel
e. Finish: High Gloss

PART 3 - **EXECUTION**

3.1 INSTALLATION

A. General:

1. Install posts straight, true, level, plumb, and place 4'-0" into 12" diameter x 3'-8" deep concrete footing. - extend 4" of post into clean gravel at base of footing.
2. Fasten sign panel to posts with (3) carriage bolts each post & spaced evenly from bottom of sign to top.
3. Install sign assembly such that top of posts are located 2" below top of sign panel & 2" measured from side of sign panel.

B. Bracing:

1. Provide temporary bracing sufficient to keep structure stable, plumb, and in line until completed.

END OF SECTION 01 58 13

DOCUMENT 01 60 00

MATERIALS AND EQUIPMENT

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions.

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any); and

1.1.4. Imported Materials Certification.

1.2. MATERIALS AND EQUIPMENT

1.2.1. Only items approved by the District and/or Architect shall be used.

1.2.2. Contractor shall submit lists of Products and other Product information in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

1.3. MATERIALS AND EQUIPMENT COLORS

1.3.1. The Contractor shall comply with all schedule(s) of colors provided by the District and/or Architect.

1.3.2. No individual color selections will be made until after approval of all pertinent materials and equipment and after receipt of appropriate samples in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

1.3.3. Contractor shall request priority in writing for any item requiring advance ordering to maintain the approved Construction Schedule.

1.4. DELIVERY, STORAGE, AND HANDLING

1.4.1. Contractor shall deliver manufactured materials in original packages, containers, or bundles (with seals unbroken), bearing name or identification mark of manufacturer. District may inspect materials prior to Contractor unloading the delivered materials. District may reject any materials that do not conform to the Contract Documents.

1.4.2. Contractor shall deliver fabrications in as large assemblies as practicable; where specified as shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion.

1.4.3. Contractor shall store materials in such a manner as necessary to properly protect them from damage. Materials or equipment damaged by handling, weather, dirt, or from any other cause will not be accepted.

1.4.4. Materials that have been warehoused for long periods of time, stored or transported in improper environment, improperly packaged, inadequately labeled, poorly protected, excessively shipped, deviated from normal distribution pattern, or reassembled are not acceptable.

1.4.5. Contractor shall store materials so as to cause no obstructions of sidewalks, roadways, or underground services. Contractor shall protect materials and equipment furnished pursuant to the Contract Documents.

1.4.6. Contractor may store materials on Site with prior written approval by District; all materials shall remain under Contractor's control and Contractor shall remain liable for any damage to the materials. Should the Project Site not have storage area available, the Contractor shall provide for off-site storage at no cost to District.

1.4.7. When any room in Project is used as a shop or storeroom, Contractor shall be responsible for any repairs, patching, or cleaning necessary due to that use. Location of storage space shall be subject to prior written approval by District.

2. PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturers listed in various sections of the Contract Documents are names of those manufacturers that are believed to be capable of supplying one or more of the items specified therein.

2.1.2. The listing of a manufacturer does not imply that every product of that manufacturer is acceptable or as meeting the requirements of the Contract Documents.

2.2. FACILITIES AND EQUIPMENT

Contractor shall provide, install, maintain, and operate a complete and adequate facility for handling, execution, disposal, and distribution of materials and equipment as required for proper and timely performance of Work.

2.3. MATERIALS REFERENCE STANDARDS

Where materials are specified solely by reference to “standard specifications” or other general reference, and if requested by District, Contractor shall submit for review data on actual materials proposed to be incorporated into Work, listing name and address of vendor, manufacturer, or producer, and trade or brand names of those materials, and data substantiating compliance with standard specifications.

3. EXECUTION

3.1. WORKMANSHIP

3.1.1. Where not more specifically described in any other Contract Documents, workmanship shall conform to methods and operations of best standards and accepted practices of trade or trades involved and shall include items of fabrication, construction, or installation regularly furnished or required for completion (including finish and for successful operation, as intended).

3.1.2. Work shall be executed by tradespersons skilled in their respective field of work. When completed, parts shall have been durably and substantially built and present a neat appearance.

3.2. COORDINATION

3.2.1. Contractor shall coordinate installation of materials and equipment so as to not interfere with installation of other Work. Adjustment or rework because of Contractor's failure to coordinate will be at no additional cost to District.

3.2.2. Contractor shall examine in-place materials and equipment for readiness, completeness, fitness to be concealed or to receive Work , and compliance with Contract Documents. Concealing or covering work constitutes acceptance of additional cost which will result should in-place materials and equipment be found unsuitable for receiving other work or otherwise deviating from the requirements of the Contract Documents.

3.3. COMPLETENESS

Contractor shall provide all portions of the Work, unless clearly stated otherwise, installed complete and operational with all elements, accessories, anchorages, utility connections, etc., in a manner to ensure well-balanced performance, in accordance with manufacturer's recommendations and in accordance with Contract Documents. For example, electric water coolers require water, electricity, and drain services; roof drains require drain systems; sinks fit within countertop, etc. Terms such as "installed complete," "operable condition," "for use intended," "connected to all utilities," "terminate with proper cap," "adequately anchored," "patch and refinish," and "to match similar" should be assumed to apply in all cases, except where completeness of functional or operable condition is specifically stated as not required.

3.4. APPROVED INSTALLER OR APPLICATOR

Contractor shall ensure that all installations are only performed by a manufacturer's approved installer or applicator.

3.5. MANUFACTURER'S RECOMMENDATIONS

All installations shall be in accordance with manufacturer's published recommendations and specific written directions of manufacturer's representative. Should the Contract Documents differ from recommendations of manufacturer or directions of manufacturer's representative, Contractor shall analyze differences, make recommendations to the District and the Architect in writing, and shall not proceed until interpretation or clarification has been issued by the District and/or the Architect.

END OF DOCUMENT

DOCUMENT 01 66 10

DELIVERY, STORAGE AND HANDLING

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions, including, without limitation, Site Access, Conditions and Requirements; and

1.1.2. Special Conditions.

1.2. PRODUCTS

1.2.1. Products are as defined in the General Conditions.

1.2.2. Contractor shall not use and/or reuse materials and/or equipment removed from existing Premises, except as specifically permitted by the Contract Documents.

1.2.3. Contractor shall provide interchangeable components of the same manufacturer, for similar components.

1.3. TRANSPORTATION AND HANDLING

1.3.1. Contractor shall transport and handle Products in accordance with manufacturer's instructions.

1.3.2. Contractor shall promptly inspect shipments to confirm that Products comply with Contract requirements, are of correct quantity, and are undamaged.

1.3.3. Contractor shall provide equipment and personnel to properly handle Products to prevent soiling, disfigurement, or damage.

1.4. STORAGE AND PROTECTION

1.4.1. Contractor shall store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Contractor shall store sensitive Products in weather-tight, climate controlled enclosures.

1.4.2. Contractor shall place fabricated Products that are stored outside, on above-ground sloped supports.

1.4.3. Contractor shall provide off-site storage and protection for Products when Site does not permit on-site storage or protection.

1.4.4. Contractor shall cover Products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.

1.4.5. Contractor shall store loose granular materials on solid flat surfaces in a well-drained area and prevent mixing with foreign matter.

1.4.6. Contractor shall provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.

1.4.7. Contractor shall arrange storage of Products to permit access for inspection and periodically inspect to assure Products are undamaged and are maintained under specified conditions.

END OF DOCUMENT

DOCUMENT 01 73 00

EXECUTION

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Coordination and Project Meetings;

1.1.5. Submittals;

1.1.6. Materials and Equipment;

1.1.7. Cutting and Patching;

1.1.8. Contract Closeout and Final Cleaning; and

1.1.9. General Commissioning Requirements.

1.2. SUMMARY

1.2.1. This Document includes general procedural requirements governing execution of the Work including, but not limited to, the following:

1.2.1.1. Construction layout;

1.2.1.2. Field engineering and surveying;

1.2.1.3. General installation of products;

1.2.1.4. Owner furnished, Contractor installed items;

1.2.1.5. Coordination of District-installed products;

1.2.1.6. Progress cleaning;

1.2.1.7. Staring and adjusting;

1.2.1.8. Protection of installed construction; and

1.2.1.9. Correction of the Work.

1.3. SUBMITTALS

1.3.1. Qualification Data: For land surveyor or professional engineer.

1.3.2. Certificates: Submit certificate signed by land surveyor or professional engineer certifying that location and elevation of improvements comply with requirements.

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

1.3.4. Certified Surveys: Submit electronic files and three (3) paper copies signed by land surveyor or professional engineer.

1.3.5. Final Property Survey: Submit electronic files and three (3) paper copies showing the Work performed and record survey data.

2. EXECUTION

2.1. EXAMINATION

2.1.1. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning Site Work, investigate and verify the existence and location of underground utilities and other construction affecting the Work.

2.1.1.1. 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.

2.1.1.2. Furnish location data for Work related to Project that must be performed by public utilities serving the Project Site.

2.2. PREPARATION

2.2.1. 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.

2.2.2. 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.

2.2.3. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

2.2.4. 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

District per requirements of Document "Requests for Information." Include a detailed description of problem encountered, together with recommendations for any necessary changes to the Contract Documents.

2.3. CONSTRUCTION LAYOUT

2.3.1. 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 District and its consultant promptly.

2.3.2. General: Engage a land surveyor or professional engineer to lay out the Work using accepted surveying practices.

2.3.2.1. 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.

2.3.2.2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.

2.3.2.3. Inform installers of lines and levels to which they must comply.

2.3.2.4. Check the location, level and plumb, of every major element as the Work progresses.

2.3.2.5. Notify District and its consultant when deviations from required lines and levels exceed allowable tolerances.

2.3.2.6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

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

2.3.4. 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.

2.3.5. 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 District and its consultant.

2.4. FIELD ENGINEERING

2.4.1. 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.

2.4.1.1. Do not change or relocate existing benchmarks or control points without prior written approval of District and its consultant. Report lost or destroyed

permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to District and its consultant before proceeding.

2.4.1.2. Require surveyor to replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

2.4.2. Benchmarks: Establish and maintain a minimum of two (2) permanent benchmarks on Project Site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

2.4.2.1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

2.4.2.2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.

2.4.2.3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

2.4.3. Records: Contractor shall maintain a complete, accurate log of all control and survey Work as it progresses. On request of District or Architect, Contractor shall submit documentation to verify accuracy of field engineering Work at no additional cost to the District.

2.4.4. 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.

2.4.5. Final Property Survey: Prepare and submit a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor or professional engineer, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey and are in conformance with Contract Documents.

2.4.5.1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a Site corner to a legal point.

2.4.6. Compliance with Laws: Contractor is responsible for meeting all applicable codes, OSHA, safety, and shoring requirements.

2.4.7. Nonconforming Work: Contractor is responsible for any re-surveying required by correction of nonconforming Work.

2.5. INSTALLATION

2.5.1. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

2.5.1.1. Make vertical Work plumb and make horizontal Work level.

2.5.1.2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.

2.5.1.3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.

2.5.1.4. Maintain minimum headroom clearance of 7 feet in spaces without a suspended ceiling.

2.5.2. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

2.5.3. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Completion.

2.5.4. 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.

2.5.5. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels where possible.

2.5.6. 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.

2.5.7. 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.

2.5.7.1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by District.

2.5.7.2. Allow for building movement, including thermal expansion and contraction.

2.5.7.3. 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.

2.5.8. 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.

2.5.9. Hazardous Materials: Use products, cleaners, and installation materials that are not classed as hazardous per the MSDS sheets for the products where possible. If hazardous materials are necessary, inform District where and when they will be used no less than 48 hours before use. Take all recommended precautions of the materials' manufacturers to ensure safe use and clean-up.

2.6. DISTRICT-INSTALLED PRODUCTS

2.6.1. Site Access: Provide access to Project Site for District's construction forces.

2.6.2. Coordination: Coordinate construction and operations of the Work with work performed by District's construction forces.

2.6.2.1. Construction Schedule: Inform District of Contractor's preferred schedule for District's portion of the Work. Adjust Construction Schedule based on a mutually agreeable timetable. Notify District if changes to schedule are required due to differences in actual construction progress.

2.6.2.2. Preinstallation Conferences: Include District's construction forces at preinstallation conferences covering portions of the Work that are to receive District's work. Attend preinstallation conferences conducted by District's construction forces if portions of the Work depend on District's construction.

2.7. PROGRESS CLEANING

2.7.1. 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.

2.7.1.1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

2.7.1.2. Do not hold materials more than seven (7) days during normal weather or three (3) days if the temperature is expected to rise above 80 degrees F.

2.7.1.3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations. Remove hazardous and unsanitary waste materials daily.

2.7.2. Site: Maintain Project Site free of waste materials and debris.

2.7.3. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

2.7.3.1. Remove liquid spills promptly.

2.7.3.2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

2.7.4. 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.

2.7.5. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

2.7.6. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Completion.

2.7.7. 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.

2.7.8. 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 Completion.

2.7.9. 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.

2.7.10. 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.

2.8. STARTING AND ADJUSTING

2.8.1. Start equipment and operating components to confirm proper operation. Replace or repair malfunctioning units and retest.

2.8.2. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

2.8.3. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

2.8.4. 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 Document "Quality Requirements."

2.9. PROTECTION OF INSTALLED CONSTRUCTION

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

2.9.2. Comply with manufacturer's written instruction for temperature and relative humidity unless otherwise addressed in the construction planning, sequences, and instructions.

2.10. CORRECTION OF THE WORK

2.10.1. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Document "Cutting and Patching."

2.10.1.1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

2.10.2. Restore permanent facilities used during construction to their specified condition.

2.10.3. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

2.10.4. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

2.10.5. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF DOCUMENT

SECTION 01 73 29 – CUTTING AND PATCHING

PART 1 **- GENERAL**

1.1 PRINCIPAL WORK IN THIS SECTION

A. The requirements of the **Owner's** General and Supplementary Conditions, and Division 0 and Division 1 general requirements apply to the work of this Section.

B. Verify applicable dimensions, clearances and heights at the jobsite.

C. Demolition:

1. Coordinate the work of this Section with related trades.

a. Refer to Section 02 41 13 – Selective Site Demolition & Protection
b. Refer to Section 02 41 19 – Selective building Demolition & Protection

D. Furnish materials and perform labor required to execute this work as indicated on the drawings, as specified herein and as necessary to complete the work required by project conditions, including but not limited to:

1. Execute cutting, fitting or patching of work, require to:

a. Make parts fit properly.
b. Make flatwork, paving, etc. fit properly.
c. Uncover work to provide for installation of ill-timed work.
d. Remove and replace work not conforming to requirements of Contract Documents.
e. Remove and replace defective work.
f. Remove samples of installed work as specified for testing.
g. Do not endanger any work by cutting or altering work or any part of it.
h. Cut existing flatwork, paving, etc. to fit properly with new work.

2. In addition to Contract requirements, upon written instructions of Architect:

a. Uncover work to provide for **Architect's** and/or **Inspector's** observation of covered work.
b. Remove samples of installed materials for testing, when required.

3. The Contractor with structural responsibility within their scope of work shall solely execute structural cutting and patching required for this project.
4. Cutting:

a. Minor cutting will be performed by both the General and Trade Subcontractors where required for the execution of their work. Locations of all trade cutting (core boring, etc.) shall be reviewed and approved by the **General Contractor**, **Owner** and **Inspector** where required.

5. Patching: **[Specifier, select if patching part of this scope or separate if construction is separate phase]**

a. Minor patching will be performed by both the General and Trade Subcontractors where required for the execution of their work. Locations of all trade cutting (core boring, etc.) shall be reviewed and approved by the **General Contractor**, **Owner** and **Inspector** where required.
b. Will be performed under separate scope of work.

1.2 REFERENCE STANDARDS

A. 2022 California Code of Regulations (CCR), Title 24, California Building Standards Commission (CBSC) www.bsc.ca.gov current edition at time of permit issuance.

B. Title 24, California Code of Regulations, California Building Standards Commission

C. ATBCB ADAAG - Americans with Disabilities Act Accessibility Guidelines, current version.

D. CBC Energy Code, California Code of Regulations, Title 24, Part 6, California Building Standards Commission

E. Title 24, Chapter 11 – California Green Building Standards Code

1. Non-residential new construction:

a. All occupancy types.

F. Leadership in Energy and Environmental Design (LEED), www.usgbc.org/LEED (United States Green Building Council (USGBC)

1. Refer to Division 1 for version of LEED Rating System and Reference Guide applicable to project.

G. Collaborative for High Performance Schools (CHPS), www.chps.net

H. American Concrete Institute (ACI), www.aci-int.org

I. American Institute of Steel Construction (AISC), www.aisc.org

J. American Iron and Steel Institute (AISI), www.steel.org

K. American National Standards Institute (ANSI), www.ansi.org

L. American Society of Mechanical Engineers (ASME) www.asme.org

M. American Society For Testing and Materials (ASTM), www.astm.org

N. American Welding Society (AWS), www.aws.org

O. American Water-Works Association (AWWA), www.awwa.org

P. Factory Mutual (FM), www.fmglobal.com

Q. National Electrical Manufacturers Association (NEMA), www.nema.org

R. National Fire Protection Agency (NFPA), www.nfpa.org

S. Occupational Safety and Health Administration (OSHA), www.osha.gov

T. Sheet Metal and Air Conditioning Contractors, Association (SMACNA), www.smacna.org

U. Sealant, Waterproofing and Restoration Institute (SWRI), www.swrionline.org

V. US Environmental Protection Agency, www.epa.gov

1.3 PERFORMANCE, TESTING AND INSPECTION

A. General:

1. Comply with manufacturer's standards.
2. Comply with Building Code.
3. Job site inspections shall be done as herein specified and as listed in drawings.

4. Testing shall be done as herein specified and as listed in drawings.
5. Refer to Division 1 for additional requirements for DSA Projects.

1.4 SUBMITTALS

A. Refer to Division 1 for substitution, deviation and/or submittal procedures.

B. Submit Manufacturer's data and shop drawings.

1. Prior to cutting which affects structural safety, submit written notice to **Architect** and **Structural Engineer** requesting consent to proceed with cutting.
2. Prior to cutting which affects Aesthetics, submit written notice to **Architect** requesting consent to proceed with cutting.

C. Submit 48-hour advance written notice to **Architect** and **Owner** and designating time work will be uncovered.

1.5 QUALITY ASSURANCE

A. Refer to Division 1 for quality control requirements.

B. Contractor / Installer/ Fabricator shall have been in business for **five (5)** years providing/installing/finishing projects of similar size and complexity.

C. Patching of openings that are cut in any fire rated walls or membranes shall be sealed tightly using approved materials only.

1. Verify that fire rating envelopes are maintained or inspections provided prior to concealing work.
2. Cutting and patching, if required by Agencies and/or DSA to verify adequacy of protection after concealment, shall be performed at no additional cost or time extension to the **Owner**.

D. Stipulations:

1. Should conditions of work or schedule indicate change of materials or methods, submit written recommendation to **Architect** and **Owner**, including:

a. Conditions indicating change.
b. Recommendations for alternative materials or methods.
c. SUBMITTALS as required for substitutions.
d. Quotations of charges or credits.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Refer to Division 1 for product delivery, storage and handling requirements.

1.7 JOB CONDITIONS

A. Field-verify that all components, substrates, backing, etc. provided by others are installed correctly before proceeding with installation of products as herein specified.

1.8 PROTECTION

A. Protect finish surfaces at all times from surfaces and material adjacent to them.

B. Finish work defaced with other materials on surface shall be replaced.

C. Protect work under this section from damage by other trades.

1.9 GUARANTEE / WARRANTY

A. Refer to Division 1 for closeout submittal procedures.

B. Furnish initial one (1) year written warranty signed by **General Contractor** agreeing to repair and/or replace work (patching) which has failed as a result of defects in materials or workmanship.

1. Upon notification of **Owner** within the warranty period, such defects shall be repaired and replaced at no cost to the **Owner**.

1.10 RELATED WORK/SECTIONS

A. Related Sections include, but are not limited to the following:

1. Refer to Division 1 for sustainability requirements.
2. Refer to Division 1 for additional requirements for DSA projects.
3. Refer to Division 1 for construction waste management and disposal/recycling requirements.
4. Divisions 2 through 49.

B. Related Documents include, but are not limited to the following:

1. Refer to Division 1 for General Conditions.

1.11 OPERATION AND MAINTENANCE DATA

A. Submit as part of project closeout.

1. Refer to Division 1 for closeout submittal procedures.

1.12 SEQUENCING AND SCHEDULING

A. Schedule work and sequence with **General Contractor**.

B. Schedule required testing, prior to the installation of materials, components, etc.

C. Each Subcontractor shall make the field measurements necessary for their work and be responsible for its accuracy.

1. Should any structural difficulties prevent a Subcontractor or tradesman from installing their material properly, the **General Contractor** shall be promptly notified so that the **Architect** may be consulted as to how best to resolve the difficulty.
2. Cutting into the walls and floors, if necessary, shall be carefully and neatly performed and then be repaired in an approved manner.
3. The **Architect** and **Structural Engineer** shall be consulted in all cases where cutting into a structural portion of the building is either desirable or necessary so that satisfactory reinforcement or other work may be provided or installed.

D. Patching of all exposed architectural finishes shall be performed under the supervision of the **General Contractor**, but executed by the affected finish trade Subcontractor.

1. Cutting and patching of existing architectural finishes shall be minimized to the extent possible through careful routing and placement of new work.
2. The **Architect** shall have the authority to reject substandard or unacceptable patching.

E. **General Contractor** shall coordinate slab vapor emission and PH testing of concrete floors which have been sawn cut to remove portions of slab and ensure that concrete treatment within criteria of finish flooring is complete prior to the installation of finish flooring as herein specified.

1.13 VAPOR EMISSION AND ALKALINITY CONTROL COMPLIANCE

A. Refer to Section 07 28 00 – Concrete Slab Vapor Emission Control Treatment

1.14 GENERAL SYSTEM DESCRIPTION

A. Refer to drawings typically for scope of cutting and patching.

B. Cut and patch as require to complete scope of work.

C. Demolition:

1. Concrete slab on grade:

a. Refer to drawings and details.
b. Saw cut floor to remove extent of slab, but not damage existing vapor barrier.

1) Replace /patch damaged vapor Barrier.

a) Refer to Concrete Notes on structural drawings.

c. Sawn cut extent/widths shall be done as indicated and at a minimum to provide room to allow room to drill and install dowels into existing slab prior to install of new concrete.
d. Sawn cut extents of concrete/masonry shall be done to an extent necessary to remove piping, conduit, etc.
e. If water or moisture is discovered at sub base notify **Architect** immediately.
f. Schedule: **[Specifier, for demolition projects confirm if placement back in of vapor barrier, dowels and concrete will be done under Demolition scope or other and edit herein accordingly]**

1) Construction:

a) Drill holes and install rebar dowels.

i. Refer to structural drawings for typical criteria.

a. Minimum standards, unless noted otherwise:

i). Length" 12"
ii). Spacing: 12"
iii). Size:

a. 4" thick slab: 1/2" diameter
b. 5" thick slab: 5/8" diameter
c. 6" thick slab: 3/4" diameter
d. 7" thick slab: 7/8" diameter
e. 8" thick slab: 1" diameter

b) Install waterstop bar at side of sawn cut concrete face, typical.

i. Refer to Section 03 15 13 – Hydrophilic Waterstops and Specialty Waterproofing

c) Vapor Barrier:

i. Replace and repair any damaged vapor barrier membrane including taping new to existing.
ii. Refer to Concrete Notes on structural drawings and Section 03 30 00 – Cast-In-Place Concrete.

d) Place new concrete

i. Refer to Concrete Notes on structural drawings and Section 03 30 00 – Cast-In-Place Concrete.

2) Demolition:

a) Schedule: **[Specifier, select one option]**

i. Remove concrete only.

a. Refer to Section 02 41 19 – Selective Building Demolition & Protection
b. Refer to drawings.

ii. Remove concrete, drill and install dowels and reinforcing, patch and replace vapor barrier and place new concrete.

a. Refer to structural drawings
b. Refer to Section 02 41 19 – Selective Building Demolition & Protection
c. Refer to Section 03 30 00 – Cast in Place Concrete

2. Concrete slab on metal decking:

a. Refer to drawings and details.
b. Saw cut concrete to remove extent of slab, but not damage existing metal decking.
c. Sawn cut extent/widths shall be done as indicated and at a minimum to provide room to allow room to drill and install dowels into existing slab prior to install of new concrete.
d. Sawn cut extents of concrete/masonry shall be done to an extent necessary to remove piping, conduit, etc.
e. Schedule: **[Specifier, for demolition projects confirm if placement back in of vapor barrier, dowels and concrete will be done under Demolition scope or other and edit herein accordingly]**

1) Construction:

a) Drill holes and install rebar dowels.

i. Refer to structural drawings for typical criteria.

a. Minimum standards, unless noted otherwise:

i). Length" 12"
ii). Spacing: 12"
iii). Size:

a. 4" thick slab: ½" diameter
b. 5" thick slab: 5/8" diameter
c. 6" thick slab: ¾" diameter
d. 7" thick slab: 7/8" diameter
e. 8" thick slab: 1"diameter

b) Place new concrete.

i. Refer to Section 03 30 00 – Cast in Place Concrete

2) Demolition:

a) Schedule: **[Specifier, select one option]**

i. Remove concrete only.

a. Refer to Section 02 41 19 – Selective Building Demolition & Protection
b. Refer to drawings

ii. Remove concrete, drill and install dowels, reinforcing and place new concrete.

a. Refer to drawings
b. Refer to structural drawings
c. Refer to Section 02 41 19 – Selective Building Demolition & Protection
d. Refer to Section 03 30 00 – Cast in Place Concrete

3. Exterior Concrete Paving:

a. Refer to drawings and details.
b. Saw cut concrete to remove extent of paving, but not damage existing sub base.
c. Sawn cut extent/widths shall be done as indicated and at a minimum to provide room to drill and install dowels into existing slab prior and reinforcing at new extent to place new concrete.
d. Sawn cut extents of concrete/masonry shall be done to an extent necessary to remove piping, conduit, etc.
e. If water or moisture is discovered at sub base notify **Civil Engineer**, **Owner** and **Architect** immediately.
f. Schedule: **[Specifier, for demolition projects confirm if placement back in of vapor barrier, dowels and concrete will be done under Demolition scope or other and edit herein accordingly]**

1) Construction:

a) Drill holes and install rebar dowels.

i. Refer to structural drawings for typical criteria.

a. Minimum standards, unless noted otherwise:

i). Length" 12"
ii). Spacing: 12"
iii). Size:

a. 4" thick slab: 1/2" diameter
b. 5" thick slab: 5/8" diameter
c. 6" thick slab: 3/4" diameter
d. 7" thick slab: 7/8" diameter
e. 8" thick slab: 1" diameter

b) Install reinforcing:.

i. Refer to civil and structural drawings

c) Place new concrete and finish

i. Refer to drawings

ii. Refer to Section 32 13 13 – Concrete Paving

2) Demolition:

a) Schedule: **[Specifier, select one option]**

i. Remove concrete only.

a. Refer to Section 02 41 19 – Selective Building Demolition & Protection
b. Refer to drawings

ii. Remove concrete, drill and install dowels, reinforcing and place new concrete and finish as indicated in drawings.

a. Refer to civil and structural drawings
b. Refer to Section 02 41 13 – Selective Site Demolition & Protection
c. Refer to Section 03 30 00 – Cast in Place Concrete

4. Exterior Concrete Flatwork:

a. Refer to drawings and details.
b. Saw cut concrete to remove extent of flatwork, but not damage existing sub base.
c. Sawn cut extent/widths shall be done as indicated and at a minimum to provide room to drill and install dowels into existing flatwork prior and reinforcing at new extent to place new concrete.
d. Sawn cut extents of concrete/masonry shall be done to an extent necessary to remove piping, conduit, etc.
e. If water or moisture is discovered at sub base notify **Civil Engineer**, **Owner** and **Architect** immediately.
f. If water or moisture is discovered at sub base notify **Civil Engineer**, **Owner** and **Architect** immediately.
g. Schedule: **[Specifier, for demolition projects confirm if placement back in of vapor barrier, dowels and concrete will be done under Demolition scope or other and edit herein accordingly]**

1) Construction:

a) Drill holes and install rebar dowels.

i. Refer to structural drawings for typical criteria.

a. Minimum standards, unless noted otherwise:

i). Length" 12"
ii). Spacing: 12"
iii). Size:

a. 4" thick slab: 1/2" diameter
b. 5" thick slab: 5/8" diameter
c. 6" thick slab: 3/4" diameter
d. 7" thick slab: 7/8" diameter
e. 8" thick slab: 1" diameter

b) Install reinforcing:.

2. Refer to Civil Drawings and structural drawings

b. Place new concrete

1. Refer to Section 32 13 13 – Concrete Paving

2. Demolition:

a. Schedule:

1. Remove concrete only.

a. Refer to Section 02 41 19 – Selective building Demolition & Protection

2. Remove concrete, drill and install dowels, reinforcing and place new concrete and finish as indicated in drawings.

a. Refer to civil and structural drawings
b. Refer to Section 02 41 13 – Selective Site Demolition & Protection
c. Refer to Section 32 13 13 – Concrete Paving

5. Exterior Asphalt Paving:

a. Refer to drawings and details.
b. Saw cut asphalt to remove extent of paving, but not damage existing sub base.
c. Sawn cut extent/widths shall be done to allow room to drill and install dowels into existing slab prior to install of new concrete.
d. Sawn cut extents of concrete/masonry shall be done to an extent necessary to remove piping, conduit, etc.
e. Schedule: **[Specifier, for demolition projects confirm if placement back in of vapor barrier, dowels and concrete will be done under Demolition scope or other and edit herein accordingly]**

1) Construction:

a) Refer to Civil and Architectural drawings.
b) Place new asphalt

i. Refer to Section 32 12 16 – Asphalt Paving
ii. Refer to Civil drawings.

2) Demolition:

a) Schedule: **[Specifier, select one option]**

i. Remove asphalt only.

a. Refer to Section 02 41 19 – Selective Building Demolition & Protection

ii. Remove asphalt and place new asphalt and finish as indicated in drawings.

a. Refer to Civil and Structural drawings
b. Refer to Section 02 41 13 – Selective Site Demolition & Protection
c. Refer to Section 32 12 16 – Asphalt Paving

PART 2 - **PRODUCTS**

2.1 MATERIALS

A. Materials for replacement of work removed: comply with specifications for type of work to be done.

2.2 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the **General Contractor** subject to the approval of the **Architect Owner**.

PART 3 **- EXECUTION**

3.1 INSPECTION/EXAMINATION

A. Verification of Conditions:

1. Examine areas and conditions under which work is to be performed.
2. Identify conditions detrimental to proper or timely completion of work and coordinate with **General Contractor** to rectify.

B. Surface:

1. Examine and verify that receiving conditions of substrate have no defects or errors, which would result in poor or potentially defective application or cause latent defects in workmanship.

C. Inspect existing conditions of work, including elements subject to movement or damage during cutting and patching.

D. After uncovering work, inspect conditions affecting installation of new products.

3.2 COORDINATION

A. Refer to Section 01 31 13 – Project Coordination.

B. **General Contractor** shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

3.3 PREPARATION

A. Prepare work, substrates, etc. in accordance with manufacturer's recommendations.

B. Provide shoring, bracing and support as required to maintain structural integrity of work.

C. Provide protection for other portions of work.

D. Provide protection from elements.

E. Each Subcontractor shall make the field measurements necessary for their work and be responsible for its accuracy.

1. Should any structural difficulties prevent a Subcontractor or tradesman from installing their material properly, the **General Contractor** shall be promptly notified so that the **Architect** may be consulted how best to resolve the difficulty.
2. Cutting into the walls and floors, if necessary, shall be carefully and neatly performed and then be repaired in an approved manner.
3. The **Architect** and **Structural Engineer** shall be consulted in all cases where cutting into a structural portion of the building is either desirable or necessary so that satisfactory reinforcement or other work may be provided/installed.

3.4 INSTALLATION

A. General:

1. Perform work in accordance with manufacturer's recommendations, as herein specified and in accordance with drawings.

a. Proceed and provide cutting and patching as herein specified and as indicated in drawings.

B. Performance:

A. Execute fitting and adjustment of products to permit finished installation to comply with specified tolerances and finishes.

B. Perform cutting and demolition by methods which will prevent damage to other work, and will provide proper surfaces to receive installation of repairs and new work.

C. Patching of openings that are cut in any fire rated walls or membranes shall be sealed tightly using approved materials only.

a. Verify that fire rating envelopes are maintained or inspections provided prior to concealing work. Cutting and patching, if required by Agencies to verify adequacy of protection after concealment, shall be performed at no additional cost or time extension to the **Owner**.

3.5 PROTECTION AND CLEAN UP

A. Refer to Division 1 for protection and cleaning requirements.

B. Subcontractor will keep the work areas in a clean and safe condition so their rubbish, waste, and debris do not interfere with the work of others.

C. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.

D. Clean adjacent surfaces free of caulking or sealant with mechanical action or solvent as necessary, avoiding damage to other materials.

E. Perform work in accordance with manufacturer's recommendations, as herein specified and in accordance with drawings.

F. In the event of damage, immediately make all repairs and replacements necessary to the approval of the **Architect** and at no cost to the **Owner**.

G. After completion of work in this section, remove all erection equipment and implements of service, and debris.

1. Leave entire area in a neat, clean, acceptable condition.

H. Provide Guarantee/Warranties and Bonds as required in this specification section and as listed in Division 1 closeout submittal procedures.

I. Provide record drawings in accordance with Division 1 closeout submittal procedures.

J. Close out, on-site inspection will be at the discretion of the **Architect** after he receives the **General Contractor's** Notice of "Certificate of Substantial Completion".

END OF SECTION 01 73 29

SECTION 01 74 00 – PROTECTION AND CLEANING

PART 1 **- GENERAL**

1.1 REQUIREMENTS INCLUDED

A. The requirements of the **Owner's** General and Supplementary Conditions, and Division 0 and Division 1 general requirements apply to the work of this Section.

B. Coordinate the work of this Section with related trades.

C. Furnish materials and perform labor required to execute this work as indicated on the drawings, as specified herein and as necessary to complete the work required by project conditions, including but not limited to:

1. Execute protection and cleaning daily, during progress of Work, and at completion of Work, as required by General Conditions and specifications.
2. Building: Keep areas of work in building free from accumulated debris, rubbish and waste materials as work progresses.
3. Site: Keep areas of work within site free from accumulated debris, rubbish and waste materials as work progresses.
4. Protect work and materials of each Section prior to and during installation, and protect the installed work and materials of other trades.
5. In the event of damage, immediately make all repairs and replacements necessary to the approval of the **Architect** and at no cost to the **Owner**.
6. After completion of work in this Section, remove all equipment, tools, cleaning supplies, etc. from site.
7. Provide product information, instruction manuals & warrantees.

D. Coordinate protection and cleaning with each specific specification section.

E. Coordinate protection and cleaning with demolition work.

1.2 REFERENCE STANDARDS

A. 2022 California Code of Regulations (CCR), Title 24, California Building Standards Commission (CBSC) www.bsc.ca.gov current edition at time of permit issuance.

B. Title 24, California Code of Regulations, California Building Standards Commission.

C. ATBCB ADAAG - Americans with Disabilities Act Accessibility Guidelines, current version.

D. CBC Energy Code, California Code of Regulations, Title 24, Part 6, California Building Standards Commission.

E. Title 24, Chapter 11 – California Green Building Standards Code

1. Non-residential new construction:

a. All occupancy types.

F. Leadership in Energy and Environmental Design (LEED), www.usgbc.org/LEED (United States Green Building Council (USGBC)

1. Refer to Division 1 for version of LEED Rating System and Reference Guide applicable to project.

G. Collaborative for High Performance Schools (CHPS), www.chps.net

H. National Demolition Association, www.demolitionassociation.com

1.3 QUALITY ASSURANCE

A. Refer to Division 1 for quality control requirements.

B. **General Contractor** shall have been in business for **five (5)** years providing/installing/finishing similar size projects and complexity.

1.4 DISPOSAL REQUIREMENTS

A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

B. Disposal operations shall be in compliance with **General Contractor's** Construction Waste Management plan as approved by the **Owner**.

1. Refer to Division 1 for construction waste management and disposal/recycling requirements.

1.5 RELATED WORK/SECTIONS

A. Related work includes, but is not limited to the following:

1. All construction.

B. Related Sections include, but are not limited to the following:

1. Refer to Division 1 for sustainability requirements.
2. Refer to Division 1 for construction waste management and disposal/recycling requirements.
3. Division 2-49.

PART 2 **- PRODUCTS**

2.1 MATERIALS

A. Cleaning and Maintenance Products:

1. Provide data on manufacturers' recommended maintenance, cleaning, refinishing and disposal procedures for materials and products.

a. Where chemical products are recommended for these procedures, provide documentation to indicate that no component present in the cleaning product at more than 1% of the total mass of the cleaning product is a carcinogen or reproductive toxicant as defined in the lists in this specification section.
b. For purposes of reporting, identification of product VOC contents shall not be limited to those regulated under Clean Air Act (CAA) but shall also include compounds exempted from the CAA definition and listing of VOCs.
c. California EPA and local air district definitions of VOCs based on CAA are not sufficient as they exempt compounds based on non-reactivity for outdoor air pollution control but still important for indoor air quality.
d. Avoid cleaning products containing alpha-pinene, d-limonene or other unsaturated carbon double bond alkenes due to chemical reactions with ozone to form aldehydes, acidic aerosols, and ultra-fine particulate matter in indoor air.

1. The State of California Department of General Services has published specifications for Environmentally Preferable Janitorial Chemicals and a list of cleaning/maintenance products meeting these specifications. Both are available on the internet at:
    a. http://www.ciwmb.ca.gov/greenbuilding/Specs/Janitorial.doc
    b. http://www.resd.dgs.ca.gov/BPM/lists.htm

B. These procedures are for final General Contractor cleaning of the project prior to substantial completion and for provided materials and products as required by the specific specification sections.

C. Use only those cleaning materials and methods recommended by manufacturer of surface material to be cleaned and which will not damage surfaces.

D. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

2.2 CHEMICALS OF CONCERN

A. Chemicals of Concern include but are not limited to those chemicals listed below as toxic air contaminants, carcinogens, teratogens, reproductive toxins, and chemicals with established Chronic Reference Exposure Levels (REL):

B. Carcinogens: Chemicals listed as probable or known human carcinogens in the latest published edition of the following two lists:

1. California Environmental Protection Agency, Air Resources Board (ARB), list of Toxic Air Contaminants (California Air Toxics).http://www.arb.ca.gov/toxics/summary/summary.htm.
2. California Environmental Protection Agency, Office of Environmental Health Hazard Assessment (OEHHA), Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). http://www.oehha.ca.gov/prop65/prop65_list/Newlist.html.

C. Reproductive Toxicants: Chemicals known to cause reproductive toxicity including birth defects or other reproductive harm in the latest published edition of the following list: California Environmental Protection Agency, Office of Environmental Health Hazard Assessment (OEHHA), Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). http://www.oehha.ca.gov/prop65/prop65_list/Newlist.htm.
Chemicals with established Chronic Reference Exposure Levels (REL): Chronic RELs have been developed for 65 hazardous airborne substances as of January 2001. A chronic REL is an airborne concentration level that would pose no significant health risk to individuals indefinitely exposed to that level. RELs are based solely on health considerations, and are developed from the best available data in the scientific literature. The California Environmental Protection Agency, Office of Environmental Health Hazard Assessment (OEHHA) establishes and publishes RELs.

D. Chronic Reference Exposure Levels for organic chemicals with possible indoor sources, based on the California OEHHA list.

1. Do not use any of the chemicals listed in the list.
2. The most recent list may be found at: http://www.oehha.org/air/chronic_rels/allChrels.html

PART 3 **– EXECUTION**

3.1 DURING CONSTRUCTION & DEMOLITION **Specifier, select appropriate type of project scope(s) – could have new work and demo combined]**

A. Construction work, cleaning and protection refer also to the following section and the most restrictive shall govern:

   1. Refer to Division 1 for construction waste management and disposal/recycling requirements.

B. Demolition work, cleaning and protection refer also to the following sections and the most restrictive shall govern; **Specifier, select for demolition scope projects]**

   1. Refer to Division 1 for construction waste management and disposal/recycling requirements.
   2. Section 02 41 13 – Selective Site Demolition & Protection.
   3. Section 02 41 19 – Selective Building Demolition & Protection.

C. Execute periodic cleaning to keep Work, site and adjacent properties free from accumulations of waste materials, rubbish and windblown debris, resulting from construction operations.

D. Provide on-site containers for collection, disposal and/or recycling of waste materials, debris and rubbish in compliance with **General Contractor's** Construction Waste Management Plan as approved by **Owner**.

   1. Refer to Division 1 for construction waste management and disposal/recycling requirements.

E. Protect material and work as recommended by manufacturer, drawings and as specified.

   1. Clean adjacent surfaces free of caulking or sealant with mechanical action or solvent as necessary, avoiding damage to other materials.
   2. Remove masking tape immediately after tooling joints, leaving finished work in neat and clean condition.
   3. Clean all surfaces, materials, etc. free of dust and dirt.
   4. Clean up and leave premise broom clean and vacuum cleaned; clean adjoining work spotted or otherwise defaced by work of this Section.

      a. Access Floor cavity shall be cleaned to same standard as HVAC ductwork.

F. Moisture Protection:

   1. Moisture Stains:

      a. Materials with evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials;

         1. Immediately remove from site and properly dispose.
         2. Take special care to prevent accumulation of moisture on installed material and within packaging during delivery, storage, and handling to prevent development of molds and mildew on packaging and on products.

      b. Immediately remove from site and properly dispose of materials showing signs of mold and signs of mildew, including materials with moisture stains.
      c. Replace moldy materials with new, undamaged materials.
      d. Mitigate and remove all mold and mildew discovered.

   2. Ducts:

      a. Seal ducts during transportation, delivery, and construction to prevent accumulation of construction dust and construction debris inside ducts.

3. Protect interior materials from water intrusion or penetration; where interior products not intended for wet applications are exposed to moisture, immediately remove from site and dispose of properly.
4. Protect installed products using methods that do not support growth of molds and mildews.
    a. Immediately remove from site materials with mold and materials with mildew.

G. Dust Protection:

1. Clean interior spaces prior to start of finish painting and continue cleaning on as-needed basis until painting is finished.
2. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly coated surfaces.

3.2 FINAL CLEANING

A. Employ skilled workers for final cleaning.

B. Comply with specific requirements as indicated in each specification section.

C. Comply with applicable regulatory requirements during the conduct of cleaning, disposal and recycling operations and in compliance with **General Contractor's** Construction Waste Management Plan as approved by **Architect** and **Owner**.

D. Use cleaning materials which will not create hazards to health or property or cause damage to products or Work.

1. Refer to Table 1, Part 2 as herein specified for disallowed chemicals.

E. Use cleaning materials and methods recommended by the manufacturers of the products to be cleaned and as described in Part 2 of this specification section.

1. Most restrictive shall govern.

F. Cleaning: **[Specifier, if demolition only then include Demolition heading notes below]**

1. Using cleaning and maintenance products as described in Part 2 of this Section and as specifically required per each applicable specification section, including, but not limited to;
    a. General:
        1. Remove dust, dirt, grease, stains, fingerprints, labels, spilled and spattered, and other foreign materials from interior and exterior surfaces exposed to view.
        2. Polish transparent and glossy surfaces to a clear shine.
        3. Vacuum dust and dirt from all surfaces.
    b. Flatwork and Paving:
        1. Clean hard surface flatwork and paving.
        2. Power wash all exposed flatwork and paving.
            a. Stained and/or polished finish floors shall be cleaned and polished in accordance with related specification section for floor finish.
        3. Demolition – unless otherwise noted, all flatwork and paving shall be demolished as indicated in drawings and/or specified.
            a. Refer to Section 02 41 13 – Selective Site Demolition & Protection

c. Flooring:
    1. Clean hard surface finish flooring, such as, but not limited to; tile, stone, VCT, linoleum, cork, hardwood, etc., in accordance with manufacturer's cleaning, polishing and maintenance recommendations.
    2. Broom, vacuum and wet mop all exposed concrete floors.
        a. Stained and/or polished finish floors shall be cleaned and polished in accordance with related specification section for floor finish.
    3. Vacuum carpeted and soft surfaces with high efficiency particulate arrestor (HEPA) vacuum.
        a. Final cleaning shall be "Vacuum Clean".
    4. Demolition – unless otherwise noted, all flooring shall be demolished as indicated in drawings and/or specified.
        a. Refer to Section 02 41 19 – Selective Building Demolition & Protection

d. Walls:
    1. Clean surface of finish wall materials in accordance with manufacturer's cleaning and maintenance recommendations.
    2. Remove all fingerprints, scuff marks, etc. from painted gypsum board.
        a. Repaint all area's that cannot be cleaned to like new appearance.
    3. Demolition – unless otherwise noted, all walls shall be demolished as indicated in drawings and/or specified.
        a. Refer to Section 02 41 19 – Selective Building Demolition & Protection

e. Ceilings:
    1. Clean surface of finish wall materials in accordance with manufacturer's cleaning and maintenance recommendations.
    2. Remove all fingerprints, scuff marks, etc. from painted gypsum board.
        a. Repaint all area's that cannot be cleaned to like new appearance.
    3. Demolition – unless otherwise noted, all ceilings shall be demolished as indicated in drawings and/or specified.
        a. Refer to Section 02 41 19 – Selective Building Demolition & Protection

f. Exterior Wall Glazing:
    1. Wash and shine glazing and mirrors to be free of streaks.

g. Interior Wall Glazing:
    1. Wash and shine glazing and mirrors to be free of streaks.
    2. Demolition – unless otherwise noted, all flooring shall be demolished as indicated in drawings and/or specified.
        a. Refer to Section 02 41 19 – Selective Building Demolition & Protection

h. Electrical Fixtures:

1. Clean surface of finish lighting fixtures to be free of dust, finger prints etc. to a new appearance.
2. Clean out debris, bugs, etc. which have accumulated inside fixture lens.
3. Vacuum and wipe insides of electrical and low voltage panels, racks and cabinetwork.

i. Fixtures:

1. Clean equipment and fixtures to sanitary condition.

2. Demolition – unless otherwise noted, all fixtures shall be removed and disposed of as indicated in drawings and/or specified.

a. Refer to Section 02 41 19 – Selective Building Demolition & Protection
b. Refer to Section 02 41 13 – Selective Site Demolition & Protection

j. HVAC and ventilation system and components:

1. If ducts were not sealed during construction, and contain dust or dirt, clean ducts using HEPA vacuum immediately prior to Substantial Completion and prior to using ducts to circulate air.

a. Raised Access Floor cavity shall be cleaned to same standard as HVAC ductwork.

2. Replace all air filters installed at air handling units and ducts before and during construction.
3. Replace all air filters (i.e., pre and final filters) of units operated during construction in compliance with the requirements of LEED just prior to Substantial Completion; refer to specific requirements of Division 1 sustainability requirements and mechanical specification sections.
4. Oil film on sheet metal shall be removed before shipment to site.

a. However, ducts shall be inspected to confirm that no oil film is present.

1. Remove oil using cleaning and maintenance products as described in Part 2 of this Section.

5. Demolition – unless otherwise noted, all ductwork, brackets, etc. shall be removed and disposed of as indicated in drawings and/or specified.

a. Refer to Section 02 41 19 – Selective Building Demolition & Protection

6. Demolition – Ductwork: unless otherwise noted, all ductwork, brackets, etc. shall be removed and disposed of as indicated in drawings and/or specified.

a. Refer to Section 02 41 19 – Selective Building Demolition & Protection

7. Demolition –HVAC units: refer to drawings for scope of removal of units.

a. Refer to Section 02 41 19 – Selective Building Demolition & Protection

2. Recycled materials:

a. Remove and properly recycle materials removed during construction work, refer also to;

1. Refer to Division 1 for construction waste management and disposal/recycling requirements and as described in **General Contractor's** Construction Waste Management Plan as approved by the **Owner**.

b. Demolition - Remove and properly recycle materials removed during demolition work, refer also to;

1. Waste management program, refer to;

a. Refer to Division 1 for construction waste management and disposal/recycling requirements and as described in **General Contractor's** Construction Waste Management Plan as approved by the **Owner**.

3. Demolished materials:

a. Remove and properly dispose of all demolished materials during demolition work, refer also to;

1. Section 02 41 13 – Selective Site Demolition & Protection
2. Section 02 41 19 – Selective Building Demolition & Protection
3. Refer to Division 1 for construction waste management and disposal/recycling requirements and as described in **General Contractor's** Construction Waste Management Plan as approved by the **Architect** and **Owner**.

4. Waste materials:

a. Remove and properly dispose and recycle all waste materials during construction work, refer also to;

1. Refer to Division 1 for construction waste management and disposal/recycling requirements and as described in **General Contractor's** Construction Waste Management Plan as approved by the **Owner**.

b. Demolition - Remove and properly dispose and recycle all materials during demolition work, refer also to;

1. Refer to Division 1 for construction waste management and disposal/recycling requirements and as described in **General Contractor's** Construction Waste Management Plan as approved by the **Owner**.
2. Section 02 41 13 – Selective Site Demolition & Protection
3. Section 02 41 19 – Selective Building Demolition & Protection

5. Exterior:

a. Clean site and roof areas of sticks, rubbish, and other debris.
b. Broom and power wash all flatwork and paving.
c. Clean all finish paving materials such as brick, interlocking pavers, etc. in accordance with the specific manufacture.
d. Broom-clean exterior paving.
e. Rake clean ground surfaces.
f. Coordinate cleaning, protection and maintenance with all Division 2 sections.

G. Prior to final inspection or **Owner** occupancy, **General Contractor** shall conduct inspection of sight-exposed interior and exterior surfaces, and all work areas, to verify that entire Work is clean.

END OF SECTION 01 74 00

DOCUMENT 01 77 00

CONTRACT CLOSEOUT AND FINAL CLEANING

1. GENERAL

1.1. RELATED DOCUMENTS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions including, without limitation, Documents on Work and Completion of Work;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Submittals;

1.1.5. Operation and Maintenance Data;

1.1.6. Warranties;

1.1.7. Record Documents;

1.1.8. Demonstration and Training; and

1.1.9. General Commissioning Requirements.

1.2. PRELIMINARY PROCEDURES

1.2.1. Before requesting inspection for determining date of Completion, complete the following. List items below that are incomplete in request.

1.2.1.1. 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.

1.2.1.2. Advise District of pending insurance changeover requirements.

1.2.1.3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.

1.2.1.4. Obtain and submit releases permitting District unrestricted use of the Work and access to services and utilities. Include certificate of occupancy, operating certificates, and similar releases, if required.

1.2.1.5. Prepare and submit Project Record Documents, operation and maintenance manuals, Completion construction photograph prints and electronic files, damage or settlement surveys, property surveys, and similar final record information.

1.2.1.6. Deliver tools, spare parts, extra materials, and similar items to location designated by District. Label with manufacturer's name and model number where applicable.

1.2.1.7. Make final changeover of permanent locks and deliver keys to District. Advise District's personnel of changeover in security provisions.

1.2.1.8. Complete startup testing of systems.

1.2.1.9. Submit test/adjust/balance records.

1.2.1.10. Terminate and remove temporary facilities from Project Site, along with mockups, construction tools, and similar elements.

1.2.1.11. Advise District of changeover in heat and other utilities.

1.2.1.12. Submit changeover information related to District's occupancy, use, operation, and maintenance.

1.2.1.13. Complete final cleaning requirements, including touch-up painting.

1.2.1.14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

1.3. RECORD DOCUMENTS AND SHOP DRAWINGS

1.3.1. Contractor shall legibly mark each item to record actual construction, including:

1.3.1.1. Measured depths of foundation in relation to finish floor datum.

1.3.1.2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permit surface improvements.

1.3.1.3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.

1.3.1.4. Field changes of dimension and detail.

1.3.1.5. Details not on original Contract Drawings

1.3.1.6. Changes made by modification(s).

1.3.1.7. References to related Shop Drawings and modifications.

1.3.1.8. Contractor will provide one set of Record Drawings to District.

1.3.1.9. Contractor shall submit all required documents to District and/or Architect prior to or with its final Application for Payment.

1.4. COMPLETION

1.4.1. Preliminary Procedures: Before requesting inspection for determining date of Completion, complete the following:

1.4.1.1. Submit a final Application for Payment according to the Contract Documents.

1.4.1.2. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

1.4.1.3. Submit pest-control final inspection report and warranty.

1.4.1.4. Instruction of District Personnel:

1.4.1.4.1. Before final inspection, at agreed upon times, Contractor shall instruct District's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.

1.4.1.4.2. For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons within six (6) months.

1.4.1.4.3. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

1.4.1.4.4. Contractor shall prepare and insert additional data in Operation and Maintenance Manual when need for such data becomes apparent during instruction.

1.4.1.4.5. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

1.4.2. Inspection: Submit a written request for inspection.

1.4.3. **LIST OF INCOMPLETE ITEMS (PUNCH LIST)** Contractor shall notify District and Architect when Contractor considers the Work complete. Upon notification, District and Architect will prepare a list of minor items to be completed or corrected ("Punch List").

1.4.4. Contractor and/or its Subcontractors shall proceed promptly to complete and correct items on the Punch List. Failure to include an item on Punch List does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

1.4.5. Contractor shall comply with Punch List procedures as provided herein and in the Contract Documents, and maintain the presence of a Project Superintendent and Project Manager until the Punch List is complete to ensure proper and timely completion of the Punch List. Under no circumstances shall Contractor demobilize its forces prior to completion of the Punch List. Upon receipt of Contractor's written notice that all of the Punch List items have been fully completed and the Work is ready for final inspection and acceptance, District and Architect will inspect the Work and shall submit to Contractor a final inspection report noting the Work, if any, required in order to reach Completion in accordance with the Contract Documents. Absent unusual

circumstances, this report shall consist of the Punch List items not yet satisfactorily completed and any additional Punch List items not originally included.

1.4.6. Upon Contractor's completion of all items on the Punch List and any other uncompleted portions of the Work, the Contractor shall notify the District and Architect, who shall again inspect such Work. If the District and Architect find the Work complete and acceptable under the Contract Documents, the District will notify Contractor, who shall then jointly submit to the Architect and District its final Application for Payment.

1.4.7. **Costs of Multiple Inspections**. More than two (2) requests of District to make a final inspection shall be considered an additional service of District, the Architect and/or the Inspector, and all subsequent costs will be invoiced to Contractor and withheld from remaining payments, if funds are available.

1.4.8. Punch List shall be deemed complete only upon the District's determination that all items on the Punch List, and all updates to the Punch List, are complete.

1.5. WARRANTIES

1.5.1. Submittal Time: Submit written warranties on request of District for designated portions of the Work where commencement of warranties other than date of Completion is indicated.

1.5.2. Organize warranty documents into an orderly sequence as required by the Division 01 Document "Warranties."

2. PRODUCTS

2.1. MATERIALS

2.1.1. 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.

3. EXECUTION

3.1. FINAL CLEANING

3.1.1. Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations. Contractor shall use cleaning methods and procedures that reduce the overall impact on human health and the natural environment by reducing the amount of disposed waste, pollution and environmental degradation. If Project is subject to LEED certification, Contractor shall ensure compliance with the applicable LEED requirements for final cleaning of the Site.

3.1.2. Contractor shall 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.

3.1.2.1. Complete the following cleaning operations before requesting final inspection:

3.1.2.1.1. 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.

3.1.2.1.2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

3.1.2.1.3. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

3.1.2.1.4. Remove tools, construction equipment, machinery, and surplus material from Project Site.

3.1.2.1.5. Remove snow and ice to provide safe access to building.

3.1.2.1.6. 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.

3.1.2.1.7. Clean all surfaces and other work in accordance with recommendations of the manufacturer.

3.1.2.1.8. Remove spots, mortar, plaster, soil, and paint from ceramic tile, stone, and other finish materials.

3.1.2.1.9. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

3.1.2.1.10. Sweep concrete floors broom clean in unoccupied spaces.

3.1.2.1.11. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.

3.1.2.1.12. 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.

3.1.2.1.13. Remove labels that are not permanent.

3.1.2.1.14. 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.

3.1.2.1.14.1. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

3.1.2.1.15. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

3.1.2.1.16. Replace parts subject to unusual operating conditions.

3.1.2.1.17. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

3.1.2.1.18. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

3.1.2.1.19. Clean ducts, blowers, and coils if units were operated without filters during construction.

3.1.2.1.20. 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.

3.1.2.1.21. Leave Project Site clean and ready for occupancy.

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

3.1.4. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on District'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 DOCUMENT

DOCUMENT 01 78 23

OPERATION AND MAINTENANCE DATA

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions, including, without limitation, Completion of the Work;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Submittals;

1.1.5. Contract Closeout and Final Cleaning;

1.1.6. Warranties;

1.1.7. Record Documents;

1.1.8. General Commissioning Requirements.

1.2. QUALITY ASSURANCE

1.2.1. Contractor shall prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.3. FORMAT

1.3.1. Contractor shall prepare data in the form of an instructional manual entitled “OPERATIONS AND MAINTENANCE MANUAL & INSTRUCTIONS” (“Manual”).

1.3.2. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size. When multiple binders are used, Contractor shall correlate data into related consistent groupings.

1.3.3. Cover: Contractor shall identify each binder with typed or printed title "OPERATION AND MAINTENANCE MANUAL & INSTRUCTIONS"; and shall list title of Project and identify subject matter of contents.

1.3.4. Contractor shall arrange content by systems process flow under section numbers and sequence of the Table of Contents of the Contract Documents.

1.3.5. Contractor shall provide tabbed fly leaf for each separate Product and system, with typed description of Product and major component parts of equipment.

1.3.6. Text: The content shall include Manufacturer's printed data, or typewritten data on 24 pound paper.

1.3.7. Drawings: Contractor shall provide with reinforced punched binder tab and shall bind in with text; folding larger drawings to size of text pages.

1.4. CONTENTS, EACH VOLUME

1.4.1. Table of Contents: Contractor shall provide title of Project; names, addresses, and telephone numbers of the Architect, any engineers, subconsultants, Subcontractor(s), and Contractor with name of responsible parties; and schedule of Products and systems, indexed to content of the volume.

1.4.2. For Each Product or System: Contractor shall list names, addresses, and telephone numbers of Subcontractor(s) and suppliers, including local source of supplies and replacement parts.

1.4.3. Product Data: Contractor shall mark each sheet to clearly identify specific Products and component parts, and data applicable to installation. Delete inapplicable information.

1.4.4. Drawings: Contractor shall supplement Product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Contractor shall not use Project Record Documents as maintenance drawings.

1.4.5. Text: The Contractor shall include any and all information as required to supplement Product data. Contractor shall provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

1.5. MANUAL FOR MATERIALS AND FINISHES

1.5.1. Building Products, Applied Materials, and Finishes: Contractor shall include Product data, with catalog number, size, composition, and color and texture designations. Contractor shall provide information for re-ordering custom manufactured Products.

1.5.2. Instructions for Care and Maintenance: Contractor shall include Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

1.5.3. Moisture Protection and Weather Exposed Products: Contractor shall include Product data listing applicable reference standards, chemical composition, and details of installation. Contractor shall provide recommendations for inspections, maintenance, and repair.

1.5.4. Additional Requirements: Contractor shall include all additional requirements as specified in the Specifications.

1.5.5. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.6. MANUAL FOR EQUIPMENT AND SYSTEMS

1.6.1. Each Item of Equipment and Each System: Contractor shall include description of unit or system, and component parts and identify function, normal operating characteristics, and limiting conditions. Contractor shall include performance curves, with engineering data and tests, and complete nomenclature, and commercial number of replaceable parts.

1.6.2. Panelboard Circuit Directories: Contractor shall provide electrical service characteristics, controls, and communications.

1.6.3. Contractor shall include color coded wiring diagrams as installed.

1.6.4. Operating Procedures: Contractor shall include start-up, break-in, and routine normal operating instructions and sequences. Contractor shall include regulation, control, stopping, shut-down, and emergency instructions. Contractor shall include summer, winter, and any special operating instructions.

1.6.5. Maintenance Requirements: Contractor shall include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

1.6.6. Contractor shall provide servicing and lubrication schedule, and list of lubricants required.

1.6.7. Contractor shall include manufacturer's printed operation and maintenance instructions.

1.6.8. Contractor shall include sequence of operation by controls manufacturer.

1.6.9. Contractor shall provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

1.6.10. Contractor shall provide control diagrams by controls manufacturer as installed.

1.6.11. Contractor shall provide Contractor's coordination drawings, with color coded piping diagrams as installed.

1.6.12. Contractor shall provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

1.6.13. Contractor shall provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

1.6.14. Additional Requirements: Contractor shall include all additional requirements as specified in Specification(s).

1.6.15. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.7. SUBMITTAL

1.7.1. Concurrent with the Schedule of Submittals as indicated in the General Conditions, Contractor shall submit to the District for review two (2) copies of a preliminary draft of proposed formats and outlines of the contents of the Manual.

1.7.2. For equipment, or component parts of equipment put into service during construction and to be operated by District, Contractor shall submit draft content for that portion of the Manual within ten (10) days after acceptance of that equipment or component.

1.7.3. On or before the Contractor submits its final application for payment, Contractor shall submit two (2) copies of a complete Manual in final form. The District will provide comments to Contractor and Contractor must revise the content of the Manual as required by District prior to District's approval of Contractor's final Application for Payment.

1.7.4. Contractor must submit two (2) copies of revised Manual in final form within ten (10) days after receiving District's comments. Failure to do so will be a basis for the District withholding funds sufficient to protect itself for Contractor's failure to provide a final Manual to the District.

END OF DOCUMENT

DOCUMENT 01 78 36

WARRANTIES

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions, including, without limitation, Warranty/Guarantee/Indemnity;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Submittals;

1.1.5. Contract Closeout and Final Cleaning;

1.1.6. Operation and Maintenance Data;

1.1.7. Record Documents;

1.1.8. General Commissioning Requirements.

1.2. FORMAT

1.2.1. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size.

1.2.2. Cover: Contractor shall identify each binder with typed or printed title "WARRANTIES" and shall list the title of Project.

1.2.3. Table of Contents: Contractor shall provide the title of Project; name, address, and telephone number of Contractor and equipment supplier, and name of responsible principal. Contractor shall identify each item with the number and title of the specific Specification, document, provision, or section in which the name of the Product or Work item is specified.

1.2.4. Contractor shall separate each Warranty with index tab sheets keyed to the Table of Contents listing, providing full information and using separate typed sheets as necessary. Contractor shall list each applicable and/or responsible Subcontractor(s), supplier(s), and/or manufacturer(s), with name, address, and telephone number of each responsible principal(s).

1.2.5. In addition to all Warranty documentation and information required herein, Contractor shall provide its Guarantee as required by the Contract Documents.

1.3. PREPARATION

1.3.1. Contractor shall obtain Warranties, executed in duplicate by each applicable and/or responsible Subcontractor(s), supplier(s), and manufacturer(s), within ten (10) days after completion of the applicable item or Work. Except for items put into use with District's permission, Contractor shall leave date of beginning of time of Warranty until the date of Completion is determined.

1.3.2. Contractor shall verify that Warranties.

1.3.3. are in proper form, contain full information, and are notarized, when required.

1.3.4. Contractor shall co-execute submittals when required.

1.3.5. Contractor shall retain warranties until time specified for submittal.

1.4. TIME OF SUBMITTALS

1.4.1. Schedule of Warranties. Contractor shall provide District with a Schedule of Warranties at least fourteen (14) days prior to submitting its other required submittals indicated herein. This will provide District the opportunity to review the anticipated Warranties and make any comments, suggestions or revisions the District may require.

1.4.2. For equipment or component parts of equipment put into service during construction with District's permission, Contractor shall submit a draft Warranty for that equipment or component within ten (10) days after acceptance of that equipment or component.

1.4.3. On or before the Contractor submits its final application for payment, Contractor shall submit all Warranties and related documents in final form. The District shall indicate any Warranty-related Work that is being performed and incomplete at the time Contractor submits its final application for payment. District will provide comments to Contractor and Contractor must revise the content of the Warranties as required by District prior to District's approval of Contractor’s final Application for Payment.

1.4.4. For items of Work that are not completed until after the date of Completion, Contractor shall provide an updated Warranty for those item(s) of Work within ten (10) days after acceptance, listing the date of acceptance as start of the Warranty period.

END OF DOCUMENT

DOCUMENT 01 78 39

RECORD DOCUMENTS

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions, including, without limitation, Documents on Work and Completion of Work;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Submittals;

1.1.5. Contract Closeout and Final Cleaning;

1.1.6. Operation and Maintenance Data;

1.1.7. Warranties;

1.1.8. General Commissioning Requirements.

2. RECORD DOCUMENTS OR DRAWINGS

2.1. GENERAL

2.1.1. "Record Documents" and "Record Drawings" may also be referred to in the Contract Documents as "As-Built Drawings."

2.1.2. As indicated in the Contract Documents, District will provide Contractor with one set of reproducible plans of the original Drawings.

2.1.3. Contractor shall maintain at each Project Site one (1) set of marked-up Drawings and shall transfer all changes and information to those marked-up Drawings, as often as required in the Contract Documents, but in no case less than once each month. Contractor shall submit to the Project Inspector one set of reproducible vellums of the Project Record Documents ("As-Builts") showing all changes incorporated into the Work since the preceding monthly submittal. The As-Builts shall be available at the Project Site. The Contractor shall submit reproducible vellums at the conclusion of the Project following review of the blueline prints.

2.1.4. Label and date each Record Document "RECORD DOCUMENT" in legibly printed letters.

2.1.5. All deviations in construction, including but not limited to pipe and conduit locations and deviations caused, without limitation, by Change Orders, Construction Directives, RFI's, and Addenda shall be accurately and legibly recorded by Contractor.

2.1.6. Locations and changes shall be done by Contractor in a neat and legible manner and, where applicable, indicated by drawing a "cloud" around the changed or additional information.

2.2. **RECORD DOCUMENT INFORMATION**

2.2.1. Contractor shall record the following information:

2.2.1.1. Locations of Work buried under or outside each building, including, without limitation, all utilities, plumbing and electrical lines, and conduits.

2.2.1.2. Actual numbering of each electrical circuit.

2.2.1.3. Locations of significant Work concealed inside each building whose general locations are changed from those shown on the Drawings.

2.2.1.4. Locations of all items, not necessarily concealed, which vary from the Contract Documents.

2.2.1.5. Installed location of all cathodic protection anodes.

2.2.1.6. Deviations from the sizes, locations, and other features of installations shown in the Contract Documents.

2.2.1.7. Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, etc.

2.2.1.8. Sufficient information to locate Work concealed in each building with reasonable ease and accuracy.

2.2.2. In some instances, this information may be recorded by dimension. In other instances, it may be recorded in relation to the spaces in the building near which it was installed.

2.2.3. Contractor shall provide additional Drawings as necessary for clarification.

2.2.4. Contractor shall provide in an electronic format as indicated in the Contract Documents, a copy of the Drawings, made from final Shop Drawings marked "No Exceptions Taken" or "Approved as Noted."

2.2.4.1. With the District’s prior approval, Contractor may provide these reproducible Drawings in hard copy.

3. RECORD MATERIALS LOG

3.1.1. Materials Log shall be submitted prior to Completion.

3.1.2. Preparation: Mark Material Log to indicate the actual product installation where installation varies from that indicated in original Material Log.

3.1.3. Give particular attention to information on concealed materials and installations that cannot be readily identified and recorded later.

3.1.4. Mark copy with the proprietary name and characteristics of products, materials, and equipment furnished, including substitutions and product options selected.

3.1.5. Record the name of the manufacturer, supplier, installer, and other information necessary to provide a record of selections made.

3.1.6. The working copy of Materials Log shall be consistently maintained throughout construction, and shall be accessible at Project Site.

4. MAINTENANCE OF RECORD DOCUMENTS

4.1. Contractor shall store Record Documents apart from documents used for construction as follows:

4.1.1. Provide files and racks for storage of Record Documents.

4.1.2. Maintain Record Documents in a clean, dry, legible condition and in good order.

4.2. Contractor shall not use Record Documents for construction purposes.

END OF DOCUMENT

SECTION 01 79 00 – DEMONSTRATION AND TRAINING

PART 1 **- GENERAL**

1.1 REQUIREMENTS INCLUDED

A. The requirements of the **Owner's** General and Supplementary Conditions, and Division 0 and Division 1 general requirements apply to the work of this Section.

B. Section includes: Provide equipment and systems demonstration and instruction in accordance with Contract Documents

1. Videotape seminars and system demonstrations.

1.2 RELATED SECTIONS

A. Refer to Division 1 for sustainability requirements

B. Refer to Division 1 for project coordination requirements

C. Refer to Division 1 for closeout submittal procedures

D. Refer to Division 1 for Commissioning requirements

E. Divisions 21 through 28

1.3 DESCRIPTION

A. Seminar Agenda and Outline:

1. Prepare a seminar agenda and outline in consultation and cooperation with **Owner**. Include following:

a. Equipment and systems which will be included in seminars.
b. Name of companies and representatives presenting at seminars.
c. Outline of each seminar's content.
d. Time and date allocated to each system and item of equipment.

2. Submit a preliminary seminar agenda and outline for review and comment by **Owner**.

a. Revise and resubmit Agenda and outline until all seminar requirements have been satisfied and seminar dates and presenters have been finalized.

3. Submit a final seminar agenda and outline no later than eight weeks before date of Acceptance of Work.

B. Seminar organization:

1. **General Contractor's** presentation leaders shall chair seminars.

a. Coordinate qualification of training personnel, seminar contents and presentations with **Owner**.

2. Coordinate individual presentations and ensure manufacturer's representatives scheduled to be at training seminars are present.
3. Arrange for presentation leaders familiar with design operation, maintenance and troubleshooting of equipment and systems.

a. Where a single person is not familiar with all aspects of equipment or system, arrange for specialists familiar with each aspect.

4. Coordinate proposed seminar dates with **Owner** and select mutually agreeable dates.
5. Videotaping: arrange for videotaping of training seminars and system demonstrations, including seminar and demonstration questions and answers.

C. Seminar Content:

1. **Commissioning Agent** will explain design philosophy of primary systems.
2. Include following information in presentations dealing with specific systems:

a. An overview of how system is intended to operate.
b. Describe design parameters, constrains and operational requirements.
c. Describe system operation strategies.
d. Provide information to help in identifying and troubleshooting problems.

3. Include following information in presentations dealing with equipment.

a. Explanation of how equipment of how equipment operates.
b. Recommended preventative and routine maintenance.

D. System Demonstration:

1. Demonstrate operation of equipment and systems when specified in individual technical sections. Include following in demonstration.

a. Start-Up and shut down.
b. Operation.
c. Scheduled and preventative maintenance.
d. Troubleshooting.

2. Demonstration may be conducted at time of original starting with **Owner's** prior approval.

E. Seminar and Demonstration Questions:

1. Be prepared to answer questions raised by **Owner's** personnel at demonstrations and seminars.
2. If unable to satisfactorily answer question immediately, provide written response within three days.

F. Use manufacturer's operation and maintenance data as basis of instruction.

1.4 CONTRACTOR START-UP REPORT FORMS

A. Videotapes: Submit two copies of each videotape; include label on each tape and on each container identifying Project and Seminar content.

PART 2 **- PRODUCTS**
Not used

PART 3 **- EXECUTION**
Not used

END OF SECTION 01 79 00

SECTION 02 41 13 – SELECTIVE SITE DEMOLITION AND PROTECTION

PART 1 - **GENERAL**

1.1 WORK INCLUDED THIS SECTION

A. The requirements of the **Owner's** General and Supplementary Conditions, and Division 0 and Division 1 general requirements apply to the work of this Section.

B. Coordinate the work of this Section with related trades.

C. Verify applicable extents of work and dimensions at the jobsite.

D. Furnish materials and perform labor required to execute this work as indicated on the drawings, as specified herein and as necessary to complete the work required by project conditions, including but not limited to:

1. General:
    a. Pay all disposal fees
    b. Coordinate all recycling procedures and documentation
    c. Obtain all permits
    d. Coordinate and get approval for demolition of all existing utilities with **Owner** and appropriate utility company/governmental jurisdiction.
2. Scope:
    a. Demolition:
    b. Removal and Disposal:
    c. Removal and Storage for Owner use:
    d. Removal and Storage for Future Installation:
    e. Record Drawings / As-built information:
    f. Protect and maintain existing vegetation designated to be saved.

1.2 REFERENCE STANDARDS

A. 2022 California Code of Regulations (CCR), Title 24, California Building Standards Commission (CBSC) www.bsc.ca.gov current edition at time of permit issuance.

B. Title 24, California Code of Regulations, California Building Standards Commission

C. CBC Energy Code, California Code of Regulations, Title 24, Part 6, California Building Standards Commission

D. Title 24, Chapter 11 – California Green Building Standards Code
    1. Non-residential new construction
        a. All occupancy types

E. Leadership in Energy and Environmental Design (LEED), www.usgbc.org/LEED (United States Green Building Council (USGBC)

1. Refer to Division 1 for version of LEED Rating System and Reference Guide applicable to project.

F. Collaborative for High Performance Schools (CHPS), www.chps.net

G. American National Standards Institute (ANSI), www.ansi.org

H. American Society For Testing and Materials (ASTM), www.astm.org

I. Industrial Accident Commission of the State of California

J. National Demolition Association, www.demolitionassociation.com

K. Occupational Safety and Health Administration (OSHA), United States Department of Labor, www.osha.gov

1. OSHA – Regulations Standards – 29 (CFR) as approved by State of California
2. OSHA – Regulations Standards – 29 (CFR), Section 1926 Occupational Safety and Health Standards for Construction as approved by State of California

1.3 PERFORMANCE, TESTING AND INSPECTION

A. General:

1. Comply with manufacturer's standards.
2. Comply with Building Code.
3. Refer to Division 1 for additional requirements for DSA projects

B. Sustainability:

1. Refer to Division 1 sustainability requirements.
2. Refer to product criteria identified herein.

C. Refer to Division 1 for construction waste management and disposal/recycling requirements

1.4 SUBMITTALS

A. Refer to Division 1 for substitution, deviation and/or submittal procedures.

B. Submit O&M (Operation and Maintenance) manuals in accordance with Division 1 requirements and as herein specified

C. Refer to Division 1 for sustainability requirements

D. Submit a written list of all items to be submitted as indicated below and organized in a spread sheet;

1. Demolition items/material
2. Removed and disposed of items/materials
3. Removed and stored items by **Contractor** and supplied at later date to **Owner**
4. Removed and stored items to be installed at later date by **Contractor** as directed by **Owner**.
5. Acknowledgment of AS-Demolished Record Drawings to include markup of drawings and pdf files named specific to each drawing sheet for all final record keeping.
6. Protection and maintenance plan for existing vegetation.

E. Submit As-built site drawings indicating the capped off locations for all utilities.

1.5 QUALITY ASSURANCE

A. Refer to Division 1 for quality control requirements.

B. **Contractor** shall have been in business for **five (5)** years providing demolition services for projects of similar size and complexity.

C. **Contractor** shall be a member of the National Demolition Association in good standing.

D. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Refer to Division 1 for product delivery, storage and handling requirements.

1.7 JOB CONDITIONS

A. Field-verify that all work by others is installed correctly prior to proceeding with demolition work under this specification and drawings.

B. Retain and have all applicable permits obtained prior to commencing with work.

C. Hazardous materials:

1. Any known or presumed hazardous material discovered shall be brought to the **Owner's** attention immediately.
2. It is the **Contractor's** responsibility to comply with the pertinent sections, as they apply to this project, of the "Construction Safety Orders" issued by the State of California lasts edition and all OSHA requirements.
3. The **Architect**, Structural Engineer and **Owner** do not accept any responsibility for the **Contractor's** failure to comply with agency having jurisdiction, building code and/or State of California requirements.
4. The **Contractor** shall be responsible for adequate design and construction of all formwork, bracing and shoring required.

D. Safety Precautions:

1. Perform demolition work in such a manner as to prevent damage to existing facilities to remain or to be salvaged and to prevent injury to public and workmen engaged on site under this or other contracts.

1.8 PROTECTION

A. Protect finish surfaces at all times from surfaces and material adjacent to them.

B. Finish work defaced with other materials on surface shall be replaced.

C. Protect work under this section from damage by other trades.

D. Protect and maintain existing vegetation as herein specified and/or indicated in contract documents.

1.9 GUARANTEE / WARRANTY

A. Refer to Division 1 for closeout submittal procedures.

1.10 RELATED WORK / SECTIONS

A. The following is related work including, but not limited to the following;

1. New Site Work
2. Coordination with Utility Companies
3. Coordination with Agencies
4. Acquisition of permits
5. Coordination with Owner
6. Surveying

B. Related Sections include, but are not limited to the following:

1. Division 1
2. Section 01 73 29 – Cutting and Patching
3. Section 01 81 13 – Project Sustainability Requirements [Specifier, applies to all Cal-Green, LEED and/or CHPS projects]
4. Section 01 33 00 – Submittal Procedures
5. Section 01 25 00 – Substitution and Deviation Procedures
6. Section 01 50 00 – Temporary Facilities and Controls
7. Section 01 74 19 – Construction Waste Management and Disposal/Recycling
8. Section 01 78 00 – Closeout Submittals
9. Section 01 74 00 – Protection and Cleaning
10. Section 02 00 1 – Site Work - General Requirements
11. Section 02 41 19 – Selective Building Demolition
12. Section 31 22 00 – Earthwork
13. Section 31 23 00 – Trenching and Backfill
14. Section 31 25 00 – Erosion and Sedimentation Control
15. Section 02275 – Dust and Emission Control

1.11 OPERATION AND MAINTENANCE DATA

A. Refer to Division 1 for closeout submittal procedures.

1.12 SEQUENCING AND SCHEDULING

A. General:

1. Schedule work and sequence with **General Contractor**.

a. Schedule required investigation, shutoff of utilities, etc., prior to commencing with demolition, etc.
b. Coordinate work with **Owner's** representative including, but not limited to:
1. Divisions 2 - 12

B. Existing Utilities:

1. Coordinate work of disconnecting & capping existing utilities including, but not limited to;

a. Gas
b. Domestic water
c. Fire service water
d. Sewer

e. Electrical
f. Cable TV
g. Low voltage cabling,
h. Etc,

C. Existing Vegetation:

1. Coordinate work of protecting and watering (maintaining) existing vegetation to remain with the following, but not limited to;

a. Site work, including but not limited to;

1) AC Paving
2) Concrete curbs
3) Flatwork
4) Vehicular paving
5) Ramps
6) Underground utilities

b. Excavation for underground devices, piping, etc.
c. Erosion control
d. Landscape documents
e. Civil documents

D. Notices:

1. **General Contractor** shall make the following notices to **Owner** in addition to Specifications and Division 1 including, but not limited to;

a. 72 hours prior to interruption of utilities.
b. 48 hours prior to demolishing and/or removing items/materials not specific all noted in drawings and/or specifications.

PART 2 - **PRODUCTS**

2.1 ACCEPTABLE MANUFACTURERS

A. Products are acceptable to use as intended for demolition work.

B. Refer to Division 1 for substitution, deviation and/or submittal procedures

2.2 MATERIALS

A. As necessary by **Contractor** to complete their work and used for the purpose of demolition, etc. as herein specified and additionally as indicated in contract documents.

2.3 COORDINATION

A. Refer to Division 1 for project coordination requirements.

2.4 OTHER MATERIALS

A. Provide other materials, not specifically described but required for complete and proper demolition activities, as selected by the **General Contractor** subject to the approval of the **Architect** and **Owner**.

PART 3 - **EXECUTION**

3.1 INSPECTION / EXAMINATION

A. Verification of Conditions:

1. Examine areas and conditions under which demolition work is to be performed.
2. Identify conditions detrimental to proper or timely completion of demolition work and coordinate with **General Contractor** to rectify.

B. Hazardous materials:

1. Any known or presumed hazardous material discovered shall be brought to the **Owner's** attention immediately.

3.2 COORDINATION

A. **General Contractor** shall coordinate demolition work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

B. Protect all existing installations from damage.

C. Coordinate scope of work with, but not limited to; civil documents and landscape documents.

D. Take measures to prevent damage to existing items indicated to remain during the course of work under this specification.

E. All dimensions given to existing structure are approximate. Verify by field measurements the dimensions of the existing structure. Where actual conditions deviate from details shown on the drawings, notify the Structural Engineer for instructions before proceeding with work.

3.3 PREPARATION

A. Prepare work, substrates, etc. in accordance with required demolition practices.

3.4 DEMOLITION, DISPOSAL, REMOVAL, STORAGE, PROTECTION AND RECORD DRAWINGS

A. General:
1. Perform work in accordance with accepted demolition practices, as herein specified and in compliance with contract documents.
2. Pay all disposal fees
3. Coordinate all recycling procedures and documentation
4. Coordinate and get approval for demolition of all existing utilities with **Owner** and appropriate utility company/governmental jurisdiction.
5. Codes, regulations, agencies and jurisdictions:

a. Obtain all permits
b. Demolition work shall comply with;

1) Local ordinances having jurisdiction.

2) Appropriate utility company/governmental jurisdiction.
3) Safety Codes of State of California.
4) Rules and regulations of Industrial Accident Commission of State of California.

6. Perform demolition work in such manner as to prevent damage to existing facilities to remain or to be salvaged, and to prevent injury to students, public and workmen engaged on site under this or other contracts.

   a. Roofs and walls, or other building elements, shall be demolished in such manner that materials or units thereof shall fall within foundation lines of building being removed.
   b. Demolition debris shall not be allowed to accumulate on site.
   c. Hazardous work shall not be left standing or hanging overnight or weekends, but shall be knocked or pulled down at end of each day to avoid damage or injury to persons or existing facilities due to toppling or falling of such hazardous elements.

7. Wherever cutting and removal of portions of existing work is indicated, such work shall be sawn in manner that will produce neat and straight lines, parallel to adjacent surfaces or plumb for vertical surfaces.

   a. Grind smooth resulting edges of concrete slabs or walks.
   b. Neatly remove existing finish materials back to clean straight line or nearest support patches or repairs.
   c. Execute cutting and demolition by methods which will prevent damage to other work, and which will provide proper surfaces to receive installation of repairs and new work.

8. Any conflicting items not specifically shown (such as underground pipes, conduits, ect.) shall be brought to the attention of the Structural Engineer prior to further demolition.

B. Demolition:

1. General:

   a. Demolished items are to become the property of the **General Contractor** and removed from premises at **Contractor's** expense (typical, U.N.O.).

2. Remove and dispose of all items indicated in documents, including but not limited to;

   a. Concrete:

      1) Flatwork
      2) Curbs and gutters
      3) Vehicular paving
      4) Foundations – Refer to Section 02 41 19 – Selective Building Demolition
      5) Footings – Refer to Section 02 41 19 – Selective Building Demolition

   b. Electrical:

      1) Wiring
      2) Conduit
      3) Light fixtures

   c. Utilities

      1) Piping
      2) Abandoned piping

d. Vegetation

1) Trees
2) Shrubs
3) Ground Cover
4) Lawn
5) Etc.

e. Miscellaneous

1) [fill in]
2) [fill in]
3) Signage
4) Items indicated in documents
5) Any other items required to facilitate new construction
6) Existing Pavement Marking:
7) Remove rubber deposits, existing markings and other coatings adhering to pavement with scrapers, wire brushing, sandblasting, approved chemicals or mechanical abrasion.

a) Where oil or grease exist, scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application.

i. After cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through new paint.
ii. Paint new markings and striping in accordance with and under Section 32 17 23 - Pavement Markings.

C. Removal and Disposal

1. All materials resulting from demolition work, except those items specifically listed or shown to be retained by **Owner** or reinstalled, shall become property of **General Contractor** and shall be removed from premises.

2. HAUL ROUTES:

a. Establish haul routes in advance and post flagmen to assure safety of visitors, public and workers.
b. Keep streets and parking areas free of mud, rubbish, debris, etc.

1) **General Contractor** will assume responsibility for any damage resulting from hauling operations and hold **Owner** free and clear of any liability in connection therewith.

3. Appropriate utility company/governmental jurisdiction.

a. Coordinate with utility companies for and removed items that might be the property of said utility company.

D. Removal and Storage for **Owner** use:

1. Items to be retained for **Owner** shall be safely stored until said time the **Owner** requires delivery of items.

E. Removal and Storage for future Installation:

1. Items to be retained for **Owner** shall be safely stored until said time the **Owner** requires the items be installed.

F. As-Built Drawings:

1. **General Contractor** shall carefully document, photograph and provide hard copy of As-Built Drawings and Specifications of all removed items, capped off utilities and terminated utilities, conduits, etc. for as-built conditions after demolition is complete.
2. Keep record drawings in accordance with Section 01 78 00 – Closeout Submittals.

G. Protection and Maintenance of Existing Vegetation:

1. Prior to any construction or grading activities, contractor shall install vegetation & tree protection fencing, which will consist of four-foot tall plastic mesh fencing installed on six-foot poles spaced a maximum of 20 feet apart.

   a. The poles shall be installed with two feet of length below ground and four feet above ground.

2. The fencing shall encompass an area 150% of the drip line of the tree or as appropriate where curbs, walks or drive ways are installed within drip lines.

   a. In those cases, install fencing no more than 18" off back of curb or walk, and in no cases shall be less than 85% of the drip line of the tree being protected as approved by Landscape Architect.
   b. Tree protection fencing shall be installed and inspected by staff from the **Owner** prior to issuance of a permit.

3. Watering of Existing Trees

   a. Irrigation shall be applied to all existing vegetation & trees as required to maintain good health.

      1) **General Contractor** will be responsible for the health of the vegetation & trees and all materials and facilities to provide adequate water. **General Contractor** shall contact the **Owner** to determine a watering schedule and any specific care required.
      2) **General Contractor** will be liable for the replacement of like vegetation & trees in the event of death due to neglect or lack of protection by the **General Contractor**. In the event that any of the vegetation and trees begin to suffer, contact the Landscape Architect and **Owner** immediately.

3.5 FIELD QUALITY CONTROL

A. Product manufacturer shall provide field service support as requested by the Installer/Applicator

1. **General Contractor** and the product manufacturer shall make periodic on-site inspections to ensure that the materials are being installed in strict accordance with manufacturer's specifications.

2. The Applicator shall be responsible for the proper application of the materials.

B. The Applicator shall certify in writing the quality of work performed relative to the substrate system, details, installation procedures and workmanship is in accordance with project specifications and manufacturer's instructions.

C. Protection and maintenance of Existing Vegetation.

3.6 PROTECTION AND CLEAN UP

A. Refer to Division 1 for protection and cleaning requirements.

B. Subcontractor will keep the work areas in a clean and safe condition so their rubbish, waste, and debris do not interfere with the work of others and are removed from project.

C. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.

D. Perform work in accordance with manufacturer's recommendations, as herein specified and in accordance with drawings.

E. In the event of damage, immediately make all repairs and replacements necessary to the approval of the **Architect** and at no cost to the **Owner**.

F. After completion of work in this section, remove all erection equipment and implements of service, and debris.

1. Leave entire area in a neat, clean, acceptable condition.

G. Provide Guarantee/Warranties and Bonds as required in this specification section and as listed in Division 1 closeout submittal procedures.

H. Provide record drawings in accordance with Division 1 closeout submittal procedures.

I. Close out, on-site inspection will be at the discretion of the **Architect** after he receives the **General Contractor's** NOTICE of "Certificate of Substantial Completion".

END OF SECTION 02 41 13

SECTION 02 41 19 - SELECTIVE BUILDING DEMOLITION AND PROTECTION

PART 1 - **GENERAL**

1.1 WORK INCLUDED THIS SECTION

A. The requirements of the **Owner's** General and Supplementary Conditions, and Division 0 and Division 1 general requirements apply to the work of this Section.

B. Coordinate the work of this Section with related trades.

C. Verify applicable extents of work and dimensions at the jobsite.

D. Furnish materials and perform labor required to execute this work as indicated on the drawings, as specified herein and as necessary to complete the work required by project conditions, including but not limited to:

1. General:

a. Pay all disposal fees
b. Coordinate all recycling procedures and provide appropriate documentation
c. Obtain all permits
d. Coordinate and get approval for demolition of all existing utilities with Owner and appropriate utility company/governing jurisdiction.

2. Scope:

a. Including, but not limited to;

1) Demolition.
2) Concrete and metal deck saw cutting
3) Removal and Disposal.
4) Removal and Storage for Owner use.
5) Removal and Storage for Future Installation.
6) Recycling - Construction Waste Management and Recycling.
7) Waste - Construction Waste Management and Recycling.
8) Capping of piping as indicated in drawings.
9) Patching of concrete and reinforcing
10) Testing - Pressure testing of all capped piping.
11) Protection of materials and surfaces to remain after demolition is complete
12) Cleaning
13) As-Built drawings derived from Record Drawings keep at project during demolition and construction.

1.2 REFERENCE STANDARDS

A. 2022 California Code of Regulations (CCR), Title 24, California Building Standards Commission (CBSC) www.bsc.ca.gov current edition at time of permit issuance.

B. Title 24, California Code of Regulations, California Building Standards Commission

C. CBC Energy Code, California Code of Regulations, Title 24, Part 6, California Building Standards Commission

D. ATBCB ADAAG - Americans with Disabilities Act Accessibility Guidelines, current version.

E. Title 24, Chapter 11 – California Green Building Standards Code

1. Non-residential new construction

a. All occupancy types

F. Leadership in Energy and Environmental Design (LEED), www.usgbc.org/LEED (United States Green Building Council (USGBC)

1. Refer to Division 1 for version of LEED Rating System and Reference Guide applicable to project.

G. Collaborative for High Performance Schools (CHPS), www.chps.net

H. American National Standards Institute (ANSI), www.ansi.org

I. American Society of Safety Engineers, www.asse.org

J. American Society For Testing and Materials (ASTM), www.astm.org

K. National Demolition Association, www.demolitionassociation.com

L. Occupational Safety and Health Administration (OSHA), United States Department of Labor, www.osha.gov

1. OSHA – Regulations Standards – 29 (CFR) as approved by State of California
2. OSHA – Regulations Standards – 29 (CFR), Section 1926 Occupational Safety and Health Standards for Construction as approved by State of California

M. Jurisdiction having authority (JHA)

1. Within project site property lines: Contra Costa County
2. Street and frontage outside project site property lines: City of Concord

1.3 PERFORMANCE, TESTING AND INSPECTION

A. **General**:

1. Comply with manufacturer's standards.
2. Comply with Building Code.

B. **Sustainability**:

1. Refer to Division 1 sustainability requirements.
2. Refer to product criteria identified herein.
3. Refer to Division 1 for construction waste management and disposal/recycling requirements

C. **Construction Testing**:

Item	Name of Test	Performance Results	Testing Std.
Capped line voltage and low voltage conduits to remain capped	Leak testing	Fit end of conduit with threaded type cap in material to match that of conduit.	None

1.4 SUBMITTALS

A. Refer to Division 1 for substitution, deviation and/or submittal procedures.

B. Submit O&M (Operation and Maintenance) manuals in accordance with Division 1 requirements and as herein specified.

C. Refer to Division 1 for sustainability requirements.

D. Submit a written list of all items to be as indicted below and organize in a spread sheet;

1. Demolition items/material
2. Removed and disposed of items/materials
3. Removed and stored items by contractor and supplied at later date to **Owner**
4. Removed and stored items to be installed at later date by contractor as directed by **Owner**
5. Acknowledgment of "As-Demolished" scope for As-Built Record Drawings to include markup of drawings and pdf files named specific to each drawing sheet for all final record keeping and included in construction as-built documents.
    a. This shall be included in as-built record drawings.
6. Protection and maintenance plan for existing vegetation.
7. Schedule of items to be tested

E. Submit shop drawings indicating the location for concrete saw cutting with extents indicated.

1.5 QUALITY ASSURANCE

A. Refer to Division 1 for quality control requirements.

B. **Contractor** shall have been in business for **five (5)** years providing demolition services for projects of similar size and complexity.

C. **Contracto**r shall be a member of the National Demolition Association in good standing.

D. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Refer to Division 1 for product delivery, storage and handling requirements.

1.7 JOB CONDITIONS

A. Field-verify that all work by others is installed correctly prior to proceeding with demolition work under this specification and drawings.

B. Retain and have all applicable permits obtained prior to commencing with work.

C. Hazardous materials:

1. Any known or presumed hazardous material discovered shall be brought to the **Owner's** attention immediately.
2. Any mold or mildew discovered shall be brought to the **Owner's** attention immediately.

1.8 PROTECTION

A. Protect finish surfaces at all times from surfaces and material adjacent to them.

B. Finish work defaced with other materials on surface shall be replaced.

C. Protect work under this section from damage by other trades.

D. Protect all materials to remain in place after demolition is complete, including, but not limited to as herein listed and indicated in drawings.

1.9 GUARANTEE / WARRANTY

A. Refer to Division 1 for closeout submittal procedures.

1.10 RELATED WORK / SECTIONS

A. The following is related work including, but not limited to the following;

1. New Site Work
2. Coordination with Utility Companies
3. Coordination with Agencies
4. Acquisition of permits
5. Coordination with Owner
6. Surveying

B. Related Sections include, but are not limited to the following:

1. Division 1
2. Section 01 73 29 – Cutting and Patching
3. Section 01 33 00 – Submittal Procedures
4. Section 01 25 00 – Substitution and Standard Deviation Procedures
5. Section 01 50 00 – Temporary Facilities and Controls
6. Section 01 74 19 – Construction Waste Management and Disposal/Recycling
7. Section 01 78 00 – Closeout Submittals
8. Section 01 74 00 – Protection and Cleaning
9. Section 02 41 19 – Selective Building Demolition and Protection

1.11 OPERATION AND MAINTENANCE DATA

A. Refer to Division 1 for closeout submittal procedures.

1.12 SEQUENCING AND SCHEDULING

A. General:

1. Schedule work and sequence with **General Contractor**.
2. Schedule required investigation, shutoff of utilities, etc., prior to commencing with demolition, etc.
3. Coordinate with any new work to follow or occur simultaneously.
4. Coordinate work with **Owner's** representative including Existing Utilities:

B. Coordinate work of disconnecting existing capped utilities which will be connected to as part of new construction including, but not limited to;

1. Electrical
2. Cable TV
3. Low voltage cabling,

4. Etc,

C. Coordinate work of testing existing capped utilities which will remain capped after new construction including, but not limited to;
   1. Electrical
   2. Cable TV
   3. Low voltage cabling,
   4. Etc.

D. Coordinate removal and disposal of the following including, but not limited to;
   1. Light fixtures and required wiring for new construction
   2. Low Voltage Cabling
   3. District Devices

E. Coordinate reinstalling the following from demolition including, but not limited to;
   1. Light fixtures
   2. Low Voltage Cabling
   3. District Devices

F. Recycling
   1. Coordinate items and/or materials which will be recycled.
      a. Refer to Division 1 for product delivery, storage and handling requirements
      b. Refer to drawings.

G. Notices:
   1. **General Contractor** shall make the following notices to **Owner** in addition to Specifications and Division 1 including, but not limited to;
      a. 72 hours prior to interruption of utilities.
      b. 48 hours prior to demolishing and/or removing items/materials not specifically noted in drawings and/.or specifications.

PART 2 - **PRODUCTS**

2.1 ACCEPTABLE MANUFACTURERS

A. Products are acceptable to use as intended for demolition work.

B. Refer to Division 1 for substitution, deviation and/or submittal procedures.

2.2 MATERIALS

A. As necessary by contractor to complete their work and used for the purpose of demolition, etc. as herein specified and additionally as indicated in contract documents.

2.3 OTHER MATERIALS

A. Provide other materials, not specifically described but required for complete and proper demolition activities, as selected by the **General Contractor** subject to the approval of the **Architect** and **Owner**.

PART 3 - **EXECUTION**

3.1 INSPECTION / EXAMINATION

A. Verification of Conditions:

1. Examine areas and conditions under which demolition work is to be performed.
2. Identify conditions detrimental to proper or timely completion of demolition work and coordinate with **General Contractor** to rectify.

B. Hazardous materials:

1. Any known or presumed hazardous material discovered shall be brought to the **Owner's** attention immediately.

3.2 COORDINATION

A. Refer to Division 1 for project coordination requirements.

B. **General Contractor** shall coordinate demolition work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

C. Protect all existing installations from damage.

D. Coordinate scope of work with, but not limited to; civil documents and landscape documents.

E. Take measures to prevent damage to existing items indicated to remain during the course of work under this specification.

3.3 PREPARATION

A. Prepare work, substrates, etc. in accordance with required demolition practices.

3.4 INSTALLATION - DEMOLITION

A. General:

1. Perform work in accordance with accepted demolition and protection practices, as herein specified and in compliance with contract documents.
2. Pay all disposal fees
3. Coordinate all recycling procedures and documentation
4. Coordinate and get approval for demolition of all existing utilities with Owner and appropriate utility company/governmental jurisdictions having authority.
5. Codes, regulations, agencies and jurisdictions:

a. Obtain all permits
b. Demolition work shall comply with;

1) Local ordinances having jurisdiction.
2) Appropriate utility company/governmental jurisdiction.
3) Safety Codes of State of California.

4) Rules and regulations of Industrial Accident Commission of State of California.

6. Perform demolition and protection work in such manner as to prevent damage to existing facilities to remain or to be salvaged, and to prevent injury to public and workmen engaged on site under this or other contracts.

   a. Roofs and walls, or other building elements, shall be demolished in such manner that materials or units thereof shall fall within foundation lines of building being removed.
   b. Demolition debris shall not be allowed to accumulate on site.
   c. Hazardous work shall not be left standing or hanging overnight or weekends, but shall be knocked or pulled down at end of each day to avoid damage or injury to persons or existing facilities due to toppling or falling of such hazardous elements.

7. Wherever cutting and removal of portions of existing work is indicated, such work shall be sawn in manner that will produce neat and straight lines, parallel to adjacent surfaces or plumb for vertical surfaces.

   a. Grind smooth resulting edges of concrete slabs or walks.
   b. Neatly remove existing finish materials back to clean straight line or nearest support patches or repairs.
   c. Execute cutting and demolition by methods which will prevent damage to other work, and which will provide proper surfaces to receive installation of repairs and new work.

B. Demolition:

1. General:

   a. Demolished items are to become the property of the **General Contractor** and removed from premises at **Contractor's** expense, typical, U.N.O.

2. Remove and dispose of all items indicated in documents.
3. Remove and dispose of all items herein indicated including, but not limited to;

   a. Concrete:

      1) Floor slabs and reinforcing
      2) Foundations and reinforcing
      3) Footings and reinforcing
      4) Portions of floor slabs for access to piping, etc.

   b. Electrical:

      1) Wiring
      2) Conduit
      3) Light fixtures
      4) Switching and power devices
      5) J-boxes and alike items

   c. Plumbing:

      1) Piping
      2) Plumbing fixtures

   d. Framing:

1) Wall framing
2) Ceiling and soffit framing

e. Sheathing:

1) Wall sheathing
2) Ceiling sheathing

f. Finishes:

1) Flooring and adhesive to bare substrate
2) Tile and adhesive and/or thinset to bare substrate

g. Miscellaneous

1) Vacuum Piping if not fully removed from previous work
2) Accessories
3) Stair Hand railings for new and remedial work, refer to drawings
4) Items indicated in documents
5) Insulation
6) Any other items required to facilitate new construction

C. Removal and Disposal

1. All materials resulting from demolition work, except those items specifically listed or shown to be retained by **Owner** or reinstalled, shall become property of **General Contractor** and shall be removed from premises.
2. HAUL ROUTES:

a. Establish haul routes in advance and post flagmen to assure safety of visitors, public and workers.
b. Keep streets and parking areas free of mud, rubbish, debris, etc.

1) **General Contractor** will assume responsibility for any damage resulting from hauling operations and hold **Owner** free and clear of any liability in connection therewith.

3. Appropriate utility company/governmental jurisdiction.

a. Coordinate with utility companies for and removed items that might be the property of said utility company.

D. Removal and Storage for Owner use:

1. Items to be retained for **Owner** shall be safely stored until said time the **Owner** requires delivery of items.

E. Removal and Storage for future Installation for Owner:

1. Items to be retained for Owner shall be safely stored until said time the **Owner** requires the items be installed.
2. Includes items as listed in drawings and also includes, but is not limited to;

a. Exterior tile wall veneer.

F. Removal and Storage for future Installation by Contractor:

1. Items to be retained and safely stored until said time it is deemed appropriate to be installed.
2. Includes items as listed in drawings and also includes, but is not limited to;
    a. Exterior tile wall veneer.

G. Removal and Storage for future modification and/or replacement:

1. Items to be retained shall be safely stored until said time Contractor requires the items be modified replaced for installation.

H. Recycling - Construction Waste Management and Recycling:

1. Refer to Division 1 for product delivery, storage and handling requirements
2. Refer to drawings.

I. Waste - Construction Waste Management and Recycling:

1. Refer to Division 1 for product delivery, storage and handling requirements
2. Refer to drawings.

J. Capping of piping:

1. Refer to drawings
2. All capping shall be done with a threaded type assembly or approved adhesive method for pipe material.

K. Testing:

1. Pressure testing of all capped piping as herein indicted and/or noted in drawings.
2. Pressure testing of existing capped utilities.
3. In compliance with agency and/or utility having jurisdiction.

L. Protection:

1. Protect materials and surfaces to remain after demolition is complete.
    a. Repair to new condition all damaged materials.
2. Protect the following existing items/conditions and provide remedial repair as indicated in drawings and including, but not limited to;
    a. Batt insulation:
        1) Keep free of contaminants such as dust, dirt and moisture/water.
            a) If contaminated and/or damaged during demolition, then material shall be replaced in same type and thickness at a minimum of original insulation.
            b) Any insulation found to be contaminated prior to demolition work shall be immediately brought to Owner's attention, otherwise contractor shall replace at no cost to Owner.
    b. Fire Proofing:
        1) Keep free of contaminants such as dust, dirt and moisture/water.
            a) If contaminated and/or damaged during demolition, then material shall be replaced in same type and thickness at a minimum of original insulation.

b) Any fire proofing found to be damaged and/or contaminated prior to demolition work shall be immediately brought to Owner's attention, otherwise contractor shall replace at no cost to Owner.

c. Exterior wall finishes where new infill wall framing, sheathing and finishing occurs.
d. Exterior wall framing where new infill framing for exterior walls will occur.
e. Exterior awnings
f. Existing break shape metal flashing/infill at existing exterior windows when existing signage is removed.
g. EIFS exterior wall skin system when existing signage is removed.

M. Cleaning:

1. General:

a. Clean all remaining surfaces and materials after demolition is complete in accordance with Refer to Division 1 for protection and cleaning requirements.

N. Cutting of concrete and metal deck:

1. Concrete slab on grade:

a. Refer to drawings and details.
b. Saw cut floor to remove extent of slab, but not damage existing vapor barrier.

1) Replace /patch damaged vapor Barrier.

c. Sawn cut extent/widths shall be done as indicated and at a minimum to provide room to allow room to drill and install dowels into existing slab prior to install of new concrete.
d. Sawn cut extents of concrete/masonry shall be done to an extent necessary to remove piping, conduit, etc.
e. If water or moisture is discovered at sub base notify Architect immediately.
f. Schedule:

1) Demolition:
2) Schedule

a) Remove concrete only.

i. As herein specified
ii. Refer to drawings.

2. Concrete slab on metal decking:

a. Refer to drawings and details.

b. Saw cut concrete to remove extent of slab, but not damage existing metal decking.

c. Sawn cut extent/widths shall be done as indicated and at a minimum to provide room to allow room to drill and install dowels into existing slab prior to install of new concrete.

d. Sawn cut extents of concrete/masonry shall be done to an extent necessary to remove piping, conduit, etc.

e. Schedule:

1) Demolition:

2) Schedule:

a) Remove concrete only.

i. As herein specified

ii. Refer to drawings

3. Sequencing and Scheduling:

a. Schedule work and sequence with General Contractor

b. Schedule required testing, prior to the installation of materials, components, etc.

c. Cutting of all exposed architectural finishes shall be performed under the supervision of the General Contractor, but executed by the affected finish trade subcontractor.

1) Cutting and patching of existing architectural finishes shall be minimized to the extent possible through careful routing and placement of new work. The Architect shall have the authority to reject substandard or unacceptable patching.

4. Preparation:

a. Provide shoring, bracing and support as required to maintain structural integrity of work.

b. Provide protection for other portions of work.

c. Provide protection from elements.

d. Each Subcontractor shall make the field measurements necessary for their work and be responsible for its accuracy.

e. Should any structural difficulties prevent a Subcontractor or tradesman from installing their material properly, the General Contractor shall be promptly notified so that the Architect may be consulted how best to resolve the difficulty.

f. Cutting into the walls and floors, if necessary, shall be carefully and neatly performed and then be repaired in an approved manner.

g. The Architect and Structural Engineer shall be consulted in all cases where cutting into a structural portion of the building is either desirable or necessary so that satisfactory reinforcement or other work may be provided/installed.

O. Waste Management:

1. Refer to Division 1 for construction waste management and disposal/recycling requirements.

P. As-Built drawings:

1. General:

a. Carefully document, photograph and provide hard copy of As-Built Drawings and Specifications of all removed items, capped off utilities and terminated utilities, conduits, etc. for as-built conditions after demolition is complete.

1) Include As-Demolished items also

2. Submit as-built drawings for demolition work including , but not limited to;
    a. As indicated in drawings
    b. Capped piping.
    c. Termination locations for all conduit, piping, etc.
    d. Items discovered which were not noted and/or indicated in demolition drawings.
3. Refer to Division 1 for closeout submittal procedures.

3.5 FIELD QUALITY CONTROL

A. Product manufacturer shall provide field service support as requested by the Installer/Applicator
    1. General Contractor and the product manufacturer shall make periodic on-site inspections to ensure that the materials are being installed in strict accordance with manufacturer's specifications.
    2. The Applicator shall be responsible for the proper application of the materials.

B. The Applicator shall certify in writing the quality of work performed relative to the substrate system, details, installation procedures and workmanship is in accordance with project specifications and manufacturer's instructions.

3.6 PROTECTION AND CLEAN UP

A. Refer to Division 1 for protection and cleaning requirements.

B. Subcontractor will keep the work areas in a clean and safe condition so their rubbish, waste, and debris do not interfere with the work of others and are removed from project.

C. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.

D. Perform work in accordance with manufacturer's recommendations, as herein specified and in accordance with drawings.

E. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no cost to the Owner.

F. After completion of work in this section, remove all erection equipment and implements of service, and debris.
    1. Leave entire area in a neat, clean, acceptable condition.

G. Provide Guarantee/Warranties and Bonds as required in this specification section and as listed in Division 1 closeout submittal procedures.

H. Provide record drawings in accordance with Division 1 closeout submittal procedures.

I. Close out, on-site inspection will be at the discretion of the **Architect** after he receives the **General Contractor's** NOTICE of "Certificate of Substantial Completion".

END OF SECTION 02 41 19

SECTION 09 29 00 – GYPSUM BOARD AND SHEATHING SUBSTRATES

PART 1 - **GENERAL**

1.1 PRINCIPAL WORK IN THIS SECTION

A. The requirements of the **Owner's** General and Supplementary Conditions, and Division 0 and Division 1 general requirements apply to the work of this Section.

B. Coordinate the work of this Section with related trades.

C. Verify applicable dimensions at the job site.

D. Furnish materials and perform labor required to execute this work as indicated on the drawings, as specified herein and as necessary to complete the work required by project conditions, including but not limited to:

1. Interior: Gypsum wallboard and sheathing
2. Horizontal metal Shaft walls – when not included as part of Section 05 41 00
3. Exterior gypsum sheathing
4. Joint treatment
5. Surface treatment – Interior:
6. Surface treatment and fastener treatment – Exterior:
7. Sealants and Backer rod
8. Drywall Primer / Sealer
9. Related accessories
10. Reveals

1.2 REFERENCE STANDARDS

A. 2022 California Code of Regulations (CCR), Title 24, California Building Standards Commission (CBSC) www.bsc.ca.gov current edition at time of permit issuance.

B. (CCR) Title 24, (CBSC) Chapter 11 – California Green Building Standards Code

1. Non-residential new construction

a. All occupancy types

C. ATBCB ADAAG - Americans with Disabilities Act Accessibility Guidelines, current version.

D. Leadership in Energy and Environmental Design (LEED), www.usgbc.org/LEED (United States Green Building Council (USGBC)

1. Refer to Division 1 for version of LEED Rating System and Reference Guide applicable to project.

E. Collaborative for High Performance Schools (CHPS), www.chps.net

F. American Society For Testing and Materials (ASTM) www.astm.org

1. ASTM C 36 Specification for Gypsum Wallboard
2. ASTM C 79 Specification for Gypsum Sheathing - Paper faced (Glass mat faced, see ASTM C1177)
3. ASTM C 473 Standard Test Methods for Physical Testing of Gypsum Panel Products

4. ASTM C 475 Standard Spec for Joint Compound & Joint Tape for Finishing Gypsum Board
5. ASTM C 518 Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
6. ASTM C 840 Standard Spec for Application and Finishing of Gypsum Board
    a. Comply with applicable requirements including recommendations of manufacturer, and comply with more restringent specifications as herein specified.
7. ASTM C 931 Specification for Exterior Gypsum Soffit Board
8. ASTM C 1177 Standard Spec for Glass Mat Gypsum Substrate for Use as Sheathing
9. ASTM C 1178 Standard Spec for Glass Mat Water-Resistant Gypsum Backing Panel
10. ASTM C1396 Specification for Gypsum Board
11. ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
12. ASTM E 72 Standard Test Methods of Conducting Strength Tests of Panels for Building Construction
13. ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials

G. Gypsum Association (GA) www.gypsum.org

1. GA-214 Recommended Levels of Gypsum Board Finish
2. GA-216 Specifications for the application and Finishing of Gypsum Board
3. GA-220 Gypsum Board Winter Related Installation Recommendations
4. GA-221 Repair of Gypsum Board Joint Ridging
5. GA-223 Gypsum Panel Products Types, Uses, Sizes, And Standards
6. GA-224 Installation of Predecorated Gypsum Board
7. GA-225 Repair of Fire-Rated Gypsum Board Systems
8. GA-226 Application of Gypsum Board To Form Curved Surfaces
9. GA-229 Shear Values for Screw Application OF Gypsum Board On Walls
10. GA-231 Assessing Water Damage to Gypsum Board
11. GA-232 Painting New Gypsum Board
12. GA-234 Control Joints For Fire-Resistant Rated Systems
13. GA-235 Gypsum Board Typical Mechanical and Physical Properties
14. GA-238 Guidelines for Prevention Of Mold Growth On Gypsum Board
15. GA 253 Application Of Gypsum Sheathing
16. GA-254 Fire-Resistant Gypsum Sheathing
17. GA-276 Gypsum Board Roof Underlayment Systems
18. GA-290 Gypsum Board Area Separation Walls
19. GA-530 Design Data - Gypsum Board
20. GA-600 Fire resistant Design Manual
21. GA-605 Proprietary Gypsum Panels Products For Use In UL Classified Systems
22. GA-610 Fire resistance Provided By Gypsum Board Membrane Protection
23. GA-618 Building and Inspecting Smoke Barriers
24. GA-620 Gypsum Area Separation Firewalls
25. GA-801 Handling and Storage of Gypsum Panel Products

H. International Code Council (ICC), www.iccsafe.org

I. United States Gypsum (USG) www.usg.com

1. SA927 Application And Finishing Of Gypsum Panel Products

2. SA923 Drywall/Steel Framed Systems
3. SA924 Drywall/Wood Framed Systems
4. SA925 USG Area Separation Fire Wall/Party Wall Systems
5. SA926 USG Cavity Shaft Wall Systems
6. SA933 "Sheetrock" Brand Textures and Finish Products

J. Federation of Societies for Coating Technology (FSCT) www.coatingssocietiesinternational.org

1. Coatings Encyclopedic Dictionary

K. Painting and Decorating Contractors of America (PDCA) www.pdca.org

1. Standard P1-92 Touch Up Painting and Damage Repair
2. Standard P4-94 Responsibility for Inspection and Acceptance of Surface Prior to Painting and Decorating
3. Standard P5-94 Benchmark Sample Procedures for Paint and Other Coating System
4. Glossary of Terms, Painting and Decorating Contractors of America, Fairfax, VA.

L. Drywall Finishing Council Incorporated (DWFC) www.dwfc.org

1. Recommended Specification for Preparation of Gypsum Board Surfaces Prior to Texture Application.
2. Interior Job Condition Specifications for the Application of Drywall Joint Compounds, Drywall Textures, and Paint/Coatings.

M. National Evaluation Report (NER)

1. NER 458 Code Compliance for Exterior Ceiling Sheathing (Soffit sheathing)
2. NER 258 USG Drywall Shaft Partition Systems

1.3 PERFORMANCE

A. **General:**

1. Comply with manufacturer's standards.
2. Comply with Building Code.
3. Job site inspections shall be done as herein specified and as listed in drawings.
4. Refer to Division 1 for additional requirements for DSA projects.

B. **Standards:**

Item	Name of Test	Performance	Testing Std.
Gypsum Board / Sheathing & Sound Board	Flatness Tolerance	1/8" offsets between planes of board faces and 1/8" in 10 feet or plumb, level, warp and bow. Tolerance variation shall not be collective.	Gypsum Association

Gypsum Board / Sheathing	Recommended Levels of Gypsum Board Finish	Comply or as herein specified, whichever is more restrictive	GA-214-07 ANSI A98-7.1
	Application and Finishing of Gypsum Panel Products		GA-216-07
	Gypsum Board Winter Related Installation Recommendations		GA-220-06
	Repair of Gypsum Board Joint Ridging		GA-221-00
	Repairing Screw or nail Pops		GA-222-08
	Gypsum Panel Products Types, Uses, Sizes and Standards		GA-223-04
	Installation of Pre-decorated Gypsum Board		GA-224-08
	Repair of Fire-Rated Gypsum Board Systems		GA-225-08
	Application of Gypsum Board to Form Curved Surfaces		GA-226-08
	Shear Values for Screw Application of Gypsum Board on Walls		GA-229-08
	Assessing Water Damage to Gypsum Board		GA-231-06
	Painting New Gypsum Board		GA-232-04
	Control Joints for Fire-Resistance Rated Systems		GA-234-08
	Gypsum Board Typical Mechanical and Physical Properties		GA-235-05
	Joint Treatment Under Extreme Weather Conditions		GA-236-00
	Guidelines for Prevention of Mold Growth on Gypsum Board		GA-238-03
	Water-Resistant Gypsum Backing Board For Ceramic Tile in Wet Areas		GA-239-04
	Application of Gypsum Sheathing		GA-253-07
	Fire-Resistant Gypsum Sheathing		GA-254-07
	Gypsum Board Roof Underlayment Systems		GA-276-05
	Gypsum Board – Area Separation Walls		GA-290-02
	Fire Resistance Design Manual		GA-600-06
	Proprietary Gypsum Panel Products For Use in UL Classified Systems		GA-605-08
	Fire Resistance Provided by Gypsum Board Membrane Protection		GA-610-02
	Building and Inspecting Smoke Barriers		GA-618-04
	Handling and Storage of Gypsum Panel Products: A Guide for Distributors, Retailers, and Contractors		GA-801-07
Exterior Gypsum sheathing	Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber	10 minimum	ASTM D 3273

Exposed interior Gypsum Sheathing	Smooth Wall		
Smooth Wall / Level 5	Smooth Wall with Darby full surface float		
Horizontal shaft wall assembly – Proprietary Design	Rated assembly testing for; • 2 hour horizontal and two hour vertical at Duct shafts/duct protection • 1 &2 hour horizontal and vertical Corridor ceilings • 1 & 2 hour horizontal and vertical Stair shaft ceilings	Comply Use National Gypsum, Gold Bond gypsum	Warnock Hersey WHI 694-0300.1
Shaftwalls	Assembly	Comply	ICC NER-258
Refer to drawings and as herein specified			

C. **Sustainability:**

1. Refer to Division 1 sustainability requirements.
2. Refer to product criteria identified herein.

D. Definitions

1. Levels of gypsum board finish: (Typical)

a. **Scope.** The required level of finish of gypsum board wall and the ceiling surfaces is described with typical applications and is listed as a minimum allowable standard. All proposed deviations from these herein specifications shall be in written form of a request and approved by the **Architect** prior to installation.

b. **Terminology.** The following definitions are applicable to this document.

1. Accessories: Metal or plastic beads, trim or molding used to protect or conceal corners, edges or abutments of the gypsum board construction.
2. Back Roll: Rolling a spray painted surface with a paint roller immediately following spray application.
3. Coat: Paint, Varnish, or lacquer applied to a surface in a single application (one Layer) to form a properly distributed film when dry –ASTM

Note: Shall be applied as installed per Painting specification.

4. Critical (Severe) Lighting: A condition whereby interior surfaces are flooded by natural or artificial lighting at an oblique angle; such as lighting from large expanses of windows, glass curtain walls, skylights, or surface mounted light fixtures. Strong side lighting from windows or surface-mounted light fixtures. - ASTM

Note: See "comments" section of this document.

5. Drywall Primer: A paint material specifically formulated to fill the pores and minimize suction differences between gypsum board surfaces paper and the compound used on finished joints, angles, fastener heads, accessories, and over skim coating.

   Note: this shall be applied as part of gypsum board specification

6. Gloss: A subjective term used to describe the relative amount and nature of mirror like (specular) reflection.

   Note: FSCT

7. Joint Photographing (Telegraphing): The shadowing of the finished joint areas through the surface decoration and/or Smooth Wall

   Note: Syn telegraphing. – GA-214-96

8. Paint: Any pigmented liquid, liquefiable, or mastic composition designed for application to a substrate as a thin layer which is converted to an opaque solid film after application. Used for protection, decoration or identification or to serve some functional purpose, such as filling or concealing surface irregularities.

   Note: FSCT, shall be applied as part of painting specification

9. Properly Painted Surfaces: A surfaces that is uniform in appearance, color and sheen. It is one that is free of foreign material, lumps skins, runs, sags, holidays, misses, strike-through, or insufficient coverage. It is a surface, which is free of drips, spatters, spills, or overspray, which were caused by the **General Contractor's** work force. Compliance to meeting the criteria of a "Properly painted surface" shall be determined when viewed without magnification at a distance of five feet or more under normal lighting conditions and form a normal viewing position.

   Note: A surface uniform in appearance, color and sheen may not be achieved with a coat of primer or a single coat of topcoat. Shall be applied as part of Painting specification. – PDCA

10. Prime/Sealer: A gypsum board prime/sealer manufactured by company explicitly for priming gypsum board and formulated to fill the pores and equalize the suction difference between gypsum board surface paper and the compound used on finished joints, angles, fastener heads, and accessories, and over skim coatings. See "comments" section of this document.

    Note: Primer shall be provided by Gypsum board mfgr. and installed by gypsum board finisher in addition to "primer and finish paint as installed under separate specification Section 09 90 00."

11. Skim Coat: A thin coat of herein listed joint compound installed over the entire surface of the gypsum board to fill imperfections in the joint work, smooth the paper texture, and provide a uniform surface for a Smooth Wall appearance. Compound will be installed with Steel Trowel or Knife blade.

    Note: Spray application is not allowed

12. Spotting: To cover fastener head with joint compound.
13. Texture: A decorative treatment of gypsum board surfaces.

14. Texturing: Regular or irregular patterns typically produced by applying a mixture of joint compound and water, or proprietary texture materials including latex base texture paint, to a gypsum board surface previously coated with primer/sealer.

    Note: Refer to Heading 2.05

15. Top Coat: The finish coat(s) of a coating system, formulated for appearance and or environmental resistance.

    Note: shall be applied as part of painting specification – PDCA

16. Wall covering: Any type of paper, vinyl, fabric, or specialty material that is pasted onto a wall or ceiling in a wide array of colors, patterns, textures, and performance characteristics, such as washability and abrasion resistance.

    Note: shall be applied as part of wall covering specification - FSCT

17. Wall covering Primer: Coatings formulated to seal the porosity of new drywall, joint compounds, and most surfaces. Also formulated to promote adhesion and serviceability under wall covering products.

    Note: Shall be applied as part of wall covering specification.

1.4 SUBMITTALS AND MOCK-UPS

A. Refer to Division 1 for substitution, deviation and/or submittal procedures.

B. Submit O&M (Operation and Maintenance) manuals in accordance with Division 1 requirements and as herein specified.

C. Refer to Division 1 for sustainability requirements

D. Submit Manufacturer's data and shop drawings.

1. Drywall products
2. Joint tapes for Interior and Exterior applications
3. Joint topping material
4. Skim coat joint compound material – Smooth wall Level 5
5. Fasteners
6. Tools for product application
7. Texturing products

E. Submit samples.

1. Three (3) each 20" square portable mockups on gypsum board that include:

    a. Finish taping, mud and primer
    b. Butt joint treatment
    c. Edge treatment
    d. Specific required finishes

F. Site mock up, refer to "Field Samples / Mock Up" heading.

1.5 QUALITY ASSURANCE

A. Refer to Division 1 for quality control requirements.

B. Contractor / Installer / Fabricator shall have been in business for **five (5)** years providing/installing/finishing similar size projects and complexity.

C. Manufacturer shall have been in business for **five (5)** years providing/installing/finishing similar size projects and complexity.

D. Lead Times:

1. **General Contractor** shall coordinate with supplier to verify product lead times during bids and at award of contract, and account for such lead times in their costs and schedules.
2. **General Contractor** shall provide an itemized list of materials which might have or are confirmed to have a lead time problem and what the anticipated lead time is.
3. **General Contractor** shall certify in writing that all materials have acceptable lead times as they relate to availability for sub-contractor and **General Contractor** to meet construction schedule and sequence of construction.
4. Material with lead times in question or confirmed to be in conflict with meeting the schedule and sequence of construction must me documented at time of bid.

E. Stipulations:

1. At proprietary assemblies use specified and tested manufacturer and specific products, including but not limited to the gypsum board, fastening, etc.

F. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

1. Agenda for meeting shall include, but not be limited to; review of Smooth wall, taping for various wall coverings and texture of wall.
2. **General Contractor** shall request meeting 5 days in advance of construction.

G. Manufacturer's Representative: Make arrangements necessary to have a trained employee of the manufacturer on-site periodically during installation membrane waterproofing work to review installation procedures. **[Specifier, indicate what is being done/installed]**

1. Manufacturer's representative shall review and certify all phases of construction to verify the complete work meets specification requirements.
2. Written certification of all phases of construction shall be sent to the **Architect** by the manufacturer's representative.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Refer to Division 1 for product delivery, storage and handling requirements.

B. Comply with manufacturers recommendations

1.7 JOB CONDITIONS

A. Field-verify that all components, substrates, backing, etc. provided by others are installed correctly before proceeding with installation of products as herein specified.

B. Environmental:

1. Interior: Do not install gypsum board, joint compounds, skim coats and textures if building temperature is below 55ºF or if proper ventilation is not provided to eliminate excessive moisture from building.
    a. Temperature shall be maintained after installation.
2. Exterior: Do not install gypsum board, joint compounds, skim coats and textures if the exterior temperature is below 45ºF.

1.8 PROTECTION

A. Protect finish surfaces at all times from surfaces and material adjacent to them.

B. Finish work defaced with other materials on surface shall be replaced.

C. Protect work under this section from damage by other trades.

1.9 GUARANTEE / WARRANTY

A. Refer to Division 1 for closeout submittal procedures.

B. Furnish initial **one (1)** year written warranty signed by manufacturer and installer agreeing to repair and/or replace work which has failed as a result of defects in materials or workmanship.

1. Upon notification of **Owner** within the warranty period, such defects shall be repaired and replaced at no cost to the **Owner**.

C. Furnish manufacturer's additional [Fill in years] (fill in number) year warranty agreeing to repair and/or replace work which has failed as a result of defects in materials or workmanship.

1. Upon notification of **Owner** within the warranty period, such defects shall be repaired and replaced at no cost to the **Owner.**

1.10 RELATED WORK/SECTIONS

A. Related work includes, but is not limited to, the following:

1. Wall Framing
2. Electrical/Low Voltage Wiring & Devices
3. Wall Finish for Mechanical Work
4. Wall coverings
5. Rated wall penetrations
6. Acoustical wall assemblies and penetrations

B. Related Sections include, but are not limited to, the following**: [Specifier, include sections that require a specific finish behind them such as FRP panels]**

1. Division 1
2. Section 05 40 00 – Cold-Formed Metal Framing
3. Section 05 50 00 – Miscellaneous Metal Fabrications
4. Section 09 22 16 – Non-Structural Metal Framing
5. Section 09 90 00 – Paints and Coatings

1.11 OPERATION AND MAINTENANCE DATA

A. Submit as part of project closeout:

1. Complete instructions regarding maintenance of the materials, finishes, etc.
2. Refer to Division 1 for closeout submittal procedures.

1.12 SEQUENCING AND SCHEDULING

A. Schedule work and sequence with **General Contractor**.

B. Schedule required testing, prior to the installation of materials, components, etc.

PART 2 – **PRODUCTS**

2.1 ACCEPTABLE MANUFACTURERS

A. Single source responsibility, specified items shall be from one manufacturer for each product type.

B. Acceptable manufacturers shall be one of the following and as herein listed and in Drawings:

1. Gypsum sheathing (Interior):
    a. Typical and as indicated:
        1) Georgia Pacific (GP), www.gp.com
        2) U.S Gypsum (USG), www.usg.com
        3) National Gypsum, Gold Bond www.national-gypsum.com
    b. Where indicated:
        1) U.S Gypsum (USG), www.usg.com
    c. Alternates where allowed:
        1) National Gypsum, Gold Bond & GridMarx, www.national-gypsum.com
        2) Pabco Gypsum, www.pabcogypsum.com
2. Gypsum sheathing (Exterior):
    a. Typical and as indicated:
        1) Georgia Pacific (GP), www.gp.com
        2) U.S Gypsum (USG), www.usg.com
        3) National Gypsum, Gold Bond www.national-gypsum.com
    b. Where indicated:
        1) National Gypsum, Gold Bond, www.national-gypsum.com
3. Sound Deadening sheathing (Interior):
    a. Homasote – Typical www.homasote.com
4. Joint treatment & finishing (Interior & Exterior)
    a. U.S Gypsum (USG), www.usg.com
    b. National Gypsum, Gold Bond www.national-gypsum.com
    c. Georgia Pacific (GP), www.gp.com
    d. Bead-Ex www.usg.com

e. Hamilton www.hamiltonnw.com

5. Accessories:

a. U.S Gypsum (USG), www.usg.com
b. National Gypsum, Gold Bond & GridMarx, www.national-gypsum.com
c. Superior Metal Trim www.superiormetaltrim.com
d. Flannery, Inc., 818 837-7585, www.flannerytrim.com
e. Fry Reglet www.fryreglet.com
f. MILGO/BUFKIN, www.milgo-bufkin.com

6. Reveals/End Caps:

a. Flannery, Inc., 818 837-7585, www.flannerytrim.com
b. Superior Metal Trim www.superiormetaltrim.com
c. Fry Reglet www.fryreglet.com
d. MILGO/BUFKIN, www.milgo-bufkin.com
e. Liquid applied waterproof membrane – Laticrete, www.Laticrete.com

7. Sealants:

a. Pecora, www.precora.com
b. Refer also to Sealant Specification Section 07 92 00.

8. Reviewed Equivalent by **Architect**.

a. Substitutions and deviations shall require **Architect's** approval and shall be given in letterform.
b. Refer to Division 1 for substitution, deviation and/or submittal procedures.
c. Proposed alternate products must be equal in terms of chemical composition, color, finish, configuration, performance standards, etc.

C. All products and materials indicated shall be installed according to current listed specification requirements and manufacturers specifications/recommendations.

D. Refer to drawings, details, and other related specification section whether listed or not.

E. Details shall set basic requirements for size and configuration of systems.

2.2 MATERIALS

A. General

1. Conform to American National Standards Institute Specifications and Gypsum Association for Gypsum Wallboard finishes.
2. Sheathing type as herein specified and in accordance with manufacturer's recommendations.
3. Wall board shall be fire-rated typical, Type "X" typical, U.N.O. and comply with specified and detailed wall construction types.

B. Wallboard & Ceiling Board Sheathing

1. **INTERIOR SCHEDULE:**

a. General:

1) Type X Core, Fire Code C and/or Type XXX regarding if application is a rated assembly

b. Interior walls, U.N.O.:

1) Mfgr:

a) Typical: Georgia Pacific
b) Alternate 1: US Gypsum
c) Alternate 2: Pabco
d) Alternate 3: Nation Gypsum, Gold Bond

2) Brand:

a) Typical: ToughRock® Fireguard Type X
b) Alternate 1: Sheetrock
c) Alternate 2: Flame Curb
d) Alternate 3: Fire Shield

3) Product:

a) Typical: Type "X" Core
b) Alternate 1: Firecode "C" Core (if specific to approved design)
c) Alternate 2: Type XXX

4) Size:

a) Thickness:

i. 5/8" typical
ii. 1/2" as indicated per plan details

b) Width x Length: 4'-0" wide x 8', 9', 10', 12' or 14' (size to minimize quantity of joints)

5) Material: Paper faced gypsum core board
6) Edge: Tapered
7) Standard: ASTM C36
8) Finish: As herein specified and indicated in drawings
9) Limitations:

a) See body of this specification for specific product types for specific conditions.
b) At interior face of Exterior walls use Dens Armour Plus Fireguard, High Performance Interior Panel as herein specified unless herein in indicated otherwise or an herein approved alternate.

c. Interior Face of Exterior Walls:

1) Application: Wall Sheathing

a) Full height from floor to underside of roof decking.
b) Exposed and concealed conditions

2) Schedule: Full Height

a) Material:

i. Schedule:

a. Mfgr: Georgia Pacific

b. Product: Dens Armour Plus® Fireguard® Type X, High Performance Interior Panel
c. Size: 5/8"x 4'-0"x 8' & 10'(size to minimize quantity of joints)
d. Material: Gypsum sheathing with inorganic coated glass fiber mats on each face
e. Edge: Tapered
f. Rating: Type "X"

ii. Alternate product:

a. Mfgr: National Gypsum
b. Product: [Fill in]
c. Size: [Fill in]
d. Material: Gypsum sheathing with inorganic coated glass fiber mats on each face
e. Edge: Tapered
f. Rating: Type "X"

b) Limitations:

i. Do not use at the following locations requiring other sheathing as herein specified under the 'Wallboard & Ceiling Board for Interior conditions.

a. Curved walls – Specialty board - Non rated:
b. Curved walls – Non rated:
c. Shaft wall sheathing:
d. Abuse-resistant Impact locations – Moderate Duty:
e. Abuse-resistant Impact locations – Heavy Duty:
f. Wet locations – Showers:
g. Shaft wall sheathing:
h. Veneer wall and ceiling – non shower locations
i. Cement Plaster substrate:
j. Fully adhered Natural Stone substrate
k. Sound Damping Wall board:
l. Sound Damping Ceiling board:
m. Modular Brick Substrate

3) Finish: As herein specified and indicated in drawings including skim coat over entire surface prior to finishing.

d. <u>Curved walls – Specialty board - Non rated:</u>

1) Mfgr:

a) Typical: US Gypsum
b) Alternate 1: National Gypsum

2) Brand:

a) US Gypsum: Sheetrock
b) National Gypsum: High Flex

3) Product:

a) Typical: Flexible Gypsum Panels
b) Alternate 1: High-Flex Wall Board

4) Size:

a) Thickness: 1/4″
b) Width x Length: 4′-0″ wide x 8′, 9′, 10′

5) Material: Paper faced gypsum core board
6) Edge: Tapered
7) Radius Schedule: (minimum)

a) Lengthwise:

	Application:	Condition:	Bend Radii:	Max. Stud Spacing:
i.	Inside – Concave	Dry	32″	9″ o.c.
ii.	Inside – Concave	Wet	20″	9″ o.c.
iii.	Outside – Convex	Dry	32″	9″ o.c.
iv.	Outside – Convex	Wet	15″	6″ o.c.

b) Widthwise:

	Application:	Condition:	Bend Radii:	Max. Stud Spacing:
i.	Inside – Concave	Dry	20″	9″ o.c.
ii.	Inside – Concave	Wet	10″	6″ o.c.
iii.	Outside – Convex	Dry	11″	6″ o.c.
iv.	Outside – Convex	Wet	7″	6″ o.c.

8) Finish: As herein specified and indicated in drawings
9) Limitations:

a) Inside face of exterior walls shall be type governed by this specific location requirements.
b) Damp and wet locations shall be type governed by this specific location requirements.
c) Tile and stone veneer locations shall be type governed by this specific location requirements.

e. Curved walls – Non rated:

1) Mfgr:

a) Typical: US Gypsum
b) Alternate 1: National Gypsum

2) Brand:

a) US Gypsum: Sheetrock
b) National Gypsum: Gold Bond

3) Size:

a) Thickness per sheet:

i. 1/4″ (2 layers minimum)

a. 3'- 0" minimum radius with dry panel and panel installed with long direction perpendicular to framing.

ii. 3/8" typical

a. 6'-0" minimum radius with dry panel and panel installed with long direction perpendicular to framing.

iii. 1/2" as allowed for wall curve by gypsum board mfgr:

a. 12'- 0" minimum radius with dry panel and panel installed with long direction perpendicular to framing.

b) Width x Length:

i. 4'-0" wide x 8', 9', 10', 12' or 14' – 1/2" & 3/8" thick
ii. 4'-0" x 8' or 10' – 1/4" thick

4) Material: Paper faced gypsum core board
5) Edge: Tapered
6) Finish: As herein specified and indicated in drawings
7) Limitations:

a) Inside face of exterior walls shall be type governed by this specific location requirements.
b) Damp and wet locations shall be type governed by this specific location requirements.

c) Tile and stone veneer locations shall be type governed by this specific location requirements.

f. Curved walls - Rated:

1) Mfgr:

a) Typical: Georgia Pacific
b) Alternate 1: US Gypsum
c) Alternate 2: Pabco
d) Alternate 3: Nation Gypsum, Gold Bond

2) Brand:

a) Typical: ToughRock® Fireguard Type X
b) Alternate 1: Sheetrock
c) Alternate 2: Flame Curb
d) Alternate 3: Fire Shield

3) Product:

a) Typical: Type "X" Core
b) Alternate 1: Firecode "C" Core (if specific to approved design)
c) Alternate 2: Type XXX

4) Size:

a) Thickness:

i. 1/2"

a. 12′- 0″ radius with dry panel and panel installed with long direction perpendicular to framing
b. 2 or more layers as required meeting wall design gypsum board thickness.

ii. 5/8″

a. 18′- 0″ radius with dry panel and panel installed with long direction perpendicular to framing.
b. 2 or more layers as required meeting wall design gypsum board thickness.

b) Width x Length: 4′-0″ wide x 8′, 9′, 10′, 12′ or 14′

5) Material: Paper faced gypsum core board
6) Edge: Tapered
7) Finish: As herein specified and indicated in drawings
8) Limitations:

a) Inside face of exterior walls shall be type governed by this specific location requirements.
b) Damp and wet locations shall be type governed by this specific location requirements.
c) Tile and stone veneer locations shall be type governed by this specific location requirements.

g. Damp locations: (Non tile veneer conditions)

1) Application:

a) Toilet room walls & ceilings
b) Janitor room walls & ceilings
c) Locker rooms
d) Lounges and other rooms within the extents of Shower/Locker rooms

2) Schedule: Full Height

a) Material:

i. Mfgr: Georgia Pacific
ii. Product: Dens Armour Plus® Fireguard® Type X, High Performance Interior Panel
iii. Size:5/8″x 4′-0″x 8′ & 10′(size to minimize quantity of joints)
iv. Material: Gypsum sheathing with inorganic coated glass fiber mats on each face
v. Edge: Tapered
vi. Rating: Type “X”
vii. Joints: Self adhering fiberglass mesh tape and approved tapping compound

3) Limitations:

a) Maximum ceiling framing not to exceed 12″ o.c.
b) Do not use at shower ceilings, use Dens Shield Tile Guard (Backer Board)
c) Do not use at shower walls, use Dens Shield Tile Guard (Backer Board)

4) Standards: ASTM C630
5) Finish: As herein specified and indicated in drawings

h. Abuse-resistant Impact locations – Moderate Duty:

1) Schedule:

a) Where indicated on drawings
b) 4'-0" above finish floor unless noted otherwise in;

i. Storage rooms
ii. Janitor rooms
iii. Mechanical rooms
iv. Kitchens

2) Mfgr: USG
3) Product:

a) Series: Fiberock
b) Model: Aqua-Tough
c) Rating: Type 'FRG-G'

i. Smoke Developed: 0
ii. Flame Spread: 5

4) Size:5/8" x 4'-0" wide x 8', & 12' (size to minimize quantity of joints)
5) Material: [Fill in]

a) Characteristics:

i. Abuse resistant
ii. Water resistant
iii. Mold resistant
iv. Finishing flexible

6) Recycled content: 95%
7) Edge: Tapered
8) Limitations:

a) Wall framing not to exceed 16" o.c. [Specifier, coordinate with wall schedule]
b) Ceiling framing not to exceed 16" o.c. **[Specifier, coordinate with wall schedule]**

9) Standards: ASTM C630, C1178, D4977 and D5420
10) Finish: As herein specified and indicated in drawings

i. Abuse-resistant Impact locations – Heavy Duty:

1) Schedule:

a) Where indicated on drawings
b) 4'-0" above finish floor unless noted otherwise in;

i. School Hallways
ii. Garages

2) Mfgr: USG
3) Product:

a) Series: Fiberock
b) Model: VHI

c) Rating: Type 'FRG-G'

i. Smoke Developed: 0
ii. Flame Spread: 5

4) Size: 5/8" x 4'-0" wide x 8', & 12' (size to minimize quantity of joints)
5) Material: [Fill in]

a) Characteristics:

i. Abuse resistant
ii. Water resistant
iii. Mold resistant
iv. Finishing flexible

6) Recycled content: 95%
7) Edge: Tapered
8) Limitations:

a) Wall framing not to exceed 16" o.c. [Specifier, coordinate with wall schedule]
b) Ceiling framing not to exceed 16" o.c. [Specifier, coordinate with wall schedule]

9) Standards: ASTM C630, C1178, D4977 and D5420
10) Finish: As herein specified and indicated in drawings

j. Wet locations – Showers and water walls:

1) Applications:

a) Shower room walls and ceilings with Tile veneer

i. Schedule:

a. Mfgr: Georgia Pacific
b. Product: Dens Shield® Fireguard® Type X Tile Backer
c. Size: 5/8" x 4'-0" wide x 4'', 5', & 8' (size to minimize quantity of joints)
d. Material: Surface coated fiberglass and silicone-treated core
e. Edge: Square
f. Joints: Self adhering fiberglass mesh tape and approved tapping compound
g. Rating: Type X, UL approved for 1-hour wall construction
h. Joints: Self adhering fiberglass mesh tape and approved tapping compound

ii. Note: Waterproof liquid applied membrane, joint mesh and accessories; refer to Tile specifications.

b) Shower ceilings without Tile veneer

i. Schedule:

a. Mfgr: Georgia Pacific
b. Product: Dens Shield Tile Guard (Backer Board)
c. Size: 5/8" x 4'-0" wide x 4'', 5', & 8' (size to minimize quantity of joints)

d. Material: Surface coated fiberglass and silicone-treated core
e. Edge: Square
f. Joints: Self adhering fiberglass mesh tape and approved tapping compound
g. Rating: UL approved for 1-hour wall construction
h. Finish: Skim Coat for Level 5 finish
i. Note: Water proof liquid applied membrane, joint mesh and accessories; refer to Tile specifications.

k. Shaft wall sheathing:

1) Application: Vertical, typical, u.n.o.
2) Design: WP-7008 Proprietary
3) Shaft wall panels at elevators and as indicated by Plan Document "Wall Types"
4) Mfgr: As herein listed
5) Material: Paper faced Gypsum core
6) Products:

a) Liner Board

i. SHEETROCK® Brand, USG

a. Edge: Square
b. Thickness: 1"
c. Width: 24"
d. Length: As required
e. Classification: UL Label

ii. Toughrock, Georgia Pacific

a. Edge: Square
b. Thickness: 1"
c. Width: 24"
d. Length: As required
e. Classification: Type X

b) Face Board

i. SHEETROCK® Brand, FIRECODE® USG

a. Edge: Tapered (SW)
b. Thickness: 1/2", 5/8" and ¾"
c. Width: 4'-0"
d. Length: As required
e. Classification: Firecode C Core

ii. Toughrock, Georgia Pacific

a. Edge: Tapered
b. Thickness: 1/2" and 5/8"
c. Width: 4'-0"
d. Length: As required
e. Classification:

i). 5/8": Type X
ii). 1/2": Fireguard C

7) Finish: As herein specified and indicated in drawings

l. Thin Veneer Wall and Ceiling Sheathing – non shower locations

1) Application:

a) Ceramic Tile veneer
b) Slate veneer
c) Thin Brick veneer [Specifier, cement board is not acceptable]

2) Schedule Options:

a) Option 1:

i. Mfgr: Georgia Pacific
ii. Product: Dens Shield® Fireguard® Type X Tile Backer
iii. Size:5/8" x 4'-0" wide x 4'', 5', & 8' (size to minimize quantity of joints)
iv. Material: Surface coated and silicone-treated core
v. Edge: Square
vi. Rating: Type X, approved for 1-hour wall construction
vii. Limitations: Maximum 16" o.c. framing spacing at Restroom ceilings
viii. Finish: Level 4
ix. Joints: Self adhering fiberglass mesh tape and approved tapping compound

b) Option 2:

i. Mfgr: USG
ii. Product: Fiberock Aqua Tough Interior Panel
iii. Size:5/8" x 4'-0" wide x 4'', 8', & 12' (size to minimize quantity of joints)
iv. Material: High density paperless gypsum and cellulose wall panel
v. Edge: Tapered
vi. Tape: Sheetrock® brand joint tape – heavy use type
vii. Rating: UL approved for 1-hour wall construction
viii. Finish: Level 4 finish
ix. Joints: Self adhering fiberglass mesh tape and approved tapping compound

m. Cement Plaster substrate:

1) Application: Substrate for Cement Plaster assembly
2) Schedule:

a) Option 1:

i. Mfgr: Georgia Pacific
ii. Product: Dens Glass™ Fireguard® Type X Exterior Sheathing (formerly Dens Glass Gold)
iii. Size:5/8" x 4'-0" wide x 8', 9' and 10' (minimize quantity of joints)
iv. Material:

a. Face: Glass mat sides – gold color

v. Edge: Square

vi. Rating:

a. Designation: Type "X"
b. Flame spread: 0
c. Smoke developed: 10 or less

vii. Warranty:

a. Weather exposure: 12 months
b. Mfgr. defects: 5 years
c. Joints: Self adhering fiberglass mesh tape and approved tapping compound

b) Option 2:

i. Mfgr: National Gypsum
ii. Brand: Gold Bond®
iii. Product: eXP (formally e²XP) Fire Shield® Extended Exposure Sheathing
iv. Size:5/8" x 4'-0" wide x 8', 9' & 12' (size to minimize quantity of joints)
v. Material:

a. Faces: Coated Fiberglass Mat
b. Color: Purple

vi. Edge: Square
vii. Rating:

a. Designation: Type "X"
b. Flame spread: 0
c. Smoke developed: 10 or less

viii. Warranty:

a. Weather exposure: 12 months
b. Mfgr. defects: 5 years

ix. Joints: Self adhering fiberglass mesh tape and approved tapping compound

c) Option 3:

i. Mfgr: USG
ii. Product: Securock® Glass-Mat Sheathing
iii. Size:5/8" x 4'-0" wide x 8', 9' & 12' (size to minimize quantity of joints)
iv. Material:

a. Faces: Coated Fiberglass Mat
b. Color: Lime Green

v. Edge: Square
vi. Rating:

a. Designation: Type "X"
b. Flame spread: 0
c. Smoke developed: 10 or less

vii. Warranty:

a. Weather exposure: 12 months

b. Mfgr. defects: 5 years

viii. Joints: Self adhering fiberglass mesh tape and approved tapping compound

3) Finish: Level 4

n. Fully adhered Natural Stone substrate: **[Specifier, coord. with 04 42 00]**

1) Application: Substrate for Fully adhered Natural Stone veneer

2) Schedule:

a) Option 1:

i. Mfgr: Georgia Pacific
ii. Product: Dens Glass™ Fireguard® Type X Exterior Sheathing (forme (formerly Dens Glass Gold)
iii. Size:5/8" x 4'-0" wide x 8', 9' and 10' (minimize quantity of joints)
iv. Material:

a. Face: Glass mat sides – gold color

v. Edge: Square
vi. Rating:

a. Designation: Type "X"
b. Flame spread: 0
c. Smoke developed: 10 or less

vii. Warranty:

a. Weather exposure: 12 months
b. Mfgr. defects: 5 years

viii. Joints: Self adhering fiberglass mesh tape and approved tapping compound

b) Option 2:

i. Mfgr: National Gypsum
ii. Brand: Gold Bond®
iii. Product: eXP (formally e^2XP) Fire Shield® Extended Exposure Sheathing
iv. Size:5/8" x 4'-0" wide x 8', 9' & 12' (size to minimize quantity of joints)
v. Material:

a. Faces: Coated Fiberglass Mat
b. Color: Purple

vi. Edge: Square
vii. Rating:

a. Designation: Type "X"
b. Flame spread: 0
c. Smoke developed: 10 or less

viii. Warranty:

a. Weather exposure: 12 months
b. Mfgr. defects: 5 years

ix. Joints: Self adhering fiberglass mesh tape and approved tapping compound

c) Option 3:

i. Mfgr: USG
ii. Product: Securock® Glass-Mat Sheathing
iii. Size: 5/8" x 4'-0" wide x 8', 9' & 12' (size to minimize quantity of joints)

iv. Material:

a. Faces: Coated Fiberglass Mat
b. Color: Lime Green

v. Edge: Square
vi. Rating:

a. Designation: Type "X"
b. Flame spread: 0
c. Smoke developed: 10 or less

vii. Warranty:

a. Weather exposure: 12 months
b. Mfgr. defects: 5 years

viii. Joints: Self adhering fiberglass mesh tape and approved tapping compound

3) Finish: Level 4

o. Sound Damping Wall board:

1) Mfgr: Homasote
2) Model: 440 Sound Barrier
3) Product: Sound Dampening Board
4) Size / R Value:

a) Thickness:

i. 5/8" typical x 1.33 R Value
ii. 1/2" as indicated per Drawings x 1.2 R Value
iii. 3/4" as indicated per Drawings x 1.4 R Value

b) Width x Length: 4'-0" wide x 8', 9', 10', 12' or 14' (size to minimize quantity of joints)

5) Material: Paper faced gypsum core board
6) Edge: Square
7) Flame Spread: Class III (or C)
8) Standard: ASTM E84 & D1037

Note: This would be installed in conjunction with acoustical sealant directly over studs, then resilient channels and lastly the gypsum sheathing in accordance with manufacturer's recommendations.

p. Sound Damping Ceiling board:

1) Mfgr: Homasote

2) Model: 440 Sound Barrier
3) Product: Sound Dampening Board
4) Size / R Value:
    a) Thickness:
        i. 5/8" typical x 1.33 R Value
        ii. 1/2" as indicated per Drawings x 1.2 R Value
        iii. 3/4" as indicated per Drawings x 1.4 R Value
    b) Width x Length: 4'-0" wide x 8', 9', 10', 12' or 14' (size to minimize quantity of joints)
5) Material: Paper faced gypsum core board
6) Edge: Square
7) Flame Spread: Class III (or C)
8) Standard: ASTM E84 & D1037

[Note: Specifier, this would be installed directly over studs, then resilient channels and lastly the gypsum sheathing]

9) Finish: As herein specified and indicated in drawings

q. Sound Damping Floor sheathing:

1) Mfgr: Homasote
2) Model: 440 Sound Barrier
3) Product: Sound Dampening Board
4) Size / R Value:
    a) Thickness:
        i. 5/8" typical x 1.33 R Value
        ii. 1/2" as indicated per Drawings x 1.2 R Value
        iii. 3/4" as indicated per Drawings x 1.4 R Value
    b) Width x Length: 4'-0" wide x 8', 9', 10', 12' or 14' (size to minimize quantity of joints)
5) Material: Paper faced gypsum core board
6) Edge: Square
7) Flame Spread: Class III (or C)
8) Standard: ASTM E84 & D1037

[Note: Specifier, this would be installed over floor substrate]

r. Modular Brick Substrate:

1) Schedule: Substrate for Modular Brick assembly
    a) Option 1:
        i. Mfgr: Georgia Pacific
        ii. Product: Dens Glass™ Fireguard® Type X Exterior Sheathing (formerly Dens Glass Gold)
        iii. Size:5/8" x 4'-0" wide x 8', 9' and 10' (minimize quantity of joints)
        iv. Material:
            a. Face: Glass mat sides – gold color

v. Edge: Square
vi. Rating:

a. Designation: Type "X"
b. Flame spread: 0
c. Smoke developed: 10 or less

vii. Warranty:

a. Weather exposure: 12 months
b. Mfgr. defects: 5 years

viii. Joints: Self adhering fiberglass mesh tape and approved tapping compound

b) Option 2:

i. Mfgr: National Gypsum
ii. Brand: Gold Bond®
iii. Product: eXP (formally e²XP) Fire Shield® Extended Exposure Sheathing
iv. Size:5/8" x 4'-0" wide x 8', 9' & 12' (size to minimize quantity of joints)
v. Material:

a. Faces: Coated Fiberglass Mat
b. Color: Purple

vi. Edge: Square
vii. Rating:

a. Designation: Type "X"
b. Flame spread: 0
c. Smoke developed: 10 or less

viii. Warranty:

a. Weather exposure: 12 months
b. Mfgr. defects: 5 years

ix. Joints: Self adhering fiberglass mesh tape and approved tapping compound

c) Option 3:

i. Mfgr: USG
ii. Product: Securock® Glass-Mat Sheathing
iii. Size:5/8" x 4'-0" wide x 8', 9' & 12' (size to minimize quantity of joints)
iv. Material:

a. Faces: Coated Fiberglass Mat
b. Color: Lime Green

v. Edge: Square
vi. Rating:

a. Designation: Type "X"
b. Flame spread: 0
c. Smoke developed: 10 or less

vii. Warranty:

a. Weather exposure: 12 months
b. Mfgr. defects: 5 years

viii. Joints: Self adhering fiberglass mesh tape and approved tapping compound

2. **EXTERIOR SCHEDULE:**

a. Walls

1) Exterior sheathing schedule:

a) General, U.N.O.

i. Option 1:

a. Mfgr: Georgia Pacific
b. Product: Dens Glass™ Fireguard® Type X Exterior Sheathing (formerly Dens Glass Gold)
c. Size: 5/8" x 4'-0" wide x 8', 9' and 10' (minimize quantity of joints)
d. Material:

i). Face: Glass mat sides – gold color
ii). Edge: Square

e. Rating:

i). Designation: Type "X"
ii). Flame spread: 0
iii). Smoke developed: 10 or less

f. Warranty:

i). Weather exposure: 12 months
ii). Mfgr. defects:5 years

g. Joints: Self adhering fiberglass mesh tape and approved tapping compound

ii. Option 2:

a. Mfgr: National Gypsum
b. Brand: Gold Bond®
c. Product: eXP (formally e^2XP) Fire Shield® Extended Exposure Sheathing
d. Size: 5/8" x 4'-0" wide x 8', 9' & 12' (size to minimize quantity of joints)
e. Material:

i). Faces: Coated Fiberglass Mat
ii). Color: Purple

f. Edge: Square
g. Rating:

i). Designation: Type "X"
ii). Flame spread: 0
iii). Smoke developed: 10 or less

h. Warranty:

i). Weather exposure: 12 months
ii). Mfgr. defects: 5 years

i. Joints: Self adhering fiberglass mesh tape and approved tapping compound

iii. Option 3:

a. Mfgr: USG
b. Product: Securock® Glass-Mat Sheathing
c. Size: 5/8" x 4'-0" wide x 8', 9' & 12' (size to minimize quantity of joints)
d. Material:

i). Faces: Coated Fiberglass Mat
ii). Color: Lime Green

e. Edge: Square
f. Rating:

i). Designation: Type "X"
ii). Flame spread: 0
iii). Smoke developed: 10 or less

g. Warranty:

i). Weather exposure: 12 months
ii). Mfgr. defects: 5 years

h. Joints: Self adhering fiberglass mesh tape and approved tapping compound

iv. Interior exposed face of exterior walls:

a. Refer to heading in INTERIOR SCHEDULE portion as herein specified.

b) Cement Plaster substrate: [Specifier select one of these or leave both in for GC option]

i. Option 1:

a. Mfgr: Georgia Pacific
b. Product: Dens Glass™ Fireguard® Type X Exterior Sheathing (formerly Dens Glass Gold)
c. Size: 5/8" x 4'-0" wide x 8', 9' and 10' (minimize quantity of joints)
d. Material:

i). Face: Glass mat sides – gold color

e. Edge: Square
f. Rating:

i). Designation: Type "X"
ii). Flame spread: 0
iii). Smoke developed: 10 or less

g. Warranty:

i). Weather exposure: 12 months
ii). Mfgr. defects:5 years

h. Joints: Self adhering fiberglass mesh tape and approved tapping compound

ii. Option 2:

a. Mfgr: National Gypsum
b. Brand: Gold Bond®
c. Product: eXP (formerly e²XP) Fire Shield® Extended Exposure Sheathing
d. Size: 5/8" x 4'-0" wide x 8', 9' & 12' (size to minimize quantity of joints)
e. Material:

i). Faces: Coated Fiberglass Mat
ii). Color: Purple

f. Edge: Square
g. Rating:

i). Designation: Type "X"
ii). Flame spread: 0
iii). Smoke developed: 10 or less

h. Warranty:

i). Weather exposure: 12 months
ii). Mfgr. defects:5 years

i. Joints: Self adhering fiberglass mesh tape and approved tapping compound

iii. Option 3:

a. Mfgr: USG
b. Product: Securock® Glass-Mat Sheathing
c. Size: 5/8" x 4'-0" wide x 8', 9' & 12' (size to minimize quantity of joints)
d. Material:

i). Faces: Coated Fiberglass Mat
ii). Color: Lime Green

e. Edge: Square
f. Rating:

i). Designation: Type "X"
ii). Flame spread: 0
iii). Smoke developed: 10 or less

g. Warranty:

i). Weather exposure: 12 months
ii). Mfgr. defects:5 years

h. Joints: Self adhering fiberglass mesh tape and approved tapping compound

c) EIFS assembly substrate:

i. Option 1:

a. Mfgr: Georgia Pacific
b. Product: Dens Glass™ Fireguard® Type X Exterior Sheathing (formally Dens Glass Gold)
c. Size: 5/8" x 4'-0" wide x 8', 9' and 10' (minimize quantity of joints)
d. Material:

i). Face: Glass mat sides – gold color

e. Edge: Square
f. Rating:

i). Designation: Type "X"
ii). Flame spread: 0
iii). Smoke developed: 10 or less

g. Warranty:

i). Weather exposure: 12 months
ii). Mfgr. defects: 5 years

h. Joints: Self adhering fiberglass mesh tape and approved tapping compound

ii. Option 2:

a. Mfgr: National Gypsum
b. Brand: Gold Bond®
c. Product: eXP (formally e^2XP) Fire Shield® Extended Exposure Sheathing
d. Size: 5/8" x 4'-0" wide x 8', 9' & 12' (size to minimize quantity of joints)
e. Material:

i). Faces: Coated Fiberglass Mat
ii). Color: Purple

f. Edge: Square
g. Rating:

i). Designation: Type "X"
ii). Flame spread: 0
iii). Smoke developed: 10 or less

h. Warranty:

i). Weather exposure: 12 months
ii). Mfgr. defects: 5 years

i. Joints: Self adhering fiberglass mesh tape and approved tapping compound

iii. Option 3:

a. Mfgr: USG
b. Product: Securock® Glass-Mat Sheathing

c. Size: 5/8" x 4'-0" wide x 8', 9' & 12' (size to minimize quantity of joints)

d. Material:

i). Faces: Coated Fiberglass Mat
ii). Color: Lime Green

e. Edge: Square

f. Rating:

i). Designation: Type "X"
ii). Flame spread: 0
iii). Smoke developed: 10 or less

g. Warranty:

i). Weather exposure: 12 months
ii). Mfgr. defects:5 years

h. Joints: Self adhering fiberglass mesh tape and approved tapping compound

d) Ceilings (Exposed application): [Specifier select this if the use of EIFS or Cement Plaster is not being used, this is not preferred application]

i. Mfgr: USG
ii. Product: Sheetrock Brand – Exterior Gypsum Ceiling Board
iii. Size:5/8" x 4'-0" wide x 8'-0" and 12'-0" (minimize quantity of joints)
iv. Material: Beige color, water-repellant face paper
v. Edge: SW Tapered
vi. Rating: Firecode
vii. Testing: Flame Spread = 20, Smoke Developed = 0
viii. Limitations: Maximum framing at 12" o.c.

e) PVC Parapet assembly substrate:

i. Refer to Roofing specification

f) Roof Underlayment:

i. Schedule: Standing Seam Metal Roofing

a. Option 1:

i). Mfgr: Georgia Pacific
ii). Product: Dens Glass Sheathing (formally Dens Glass Gold)
iii). Type: Fireguard Type X Exterior Sheathing
iv). Size:5/8" x 4'-0" wide x 8', 9' and 10' (minimize quantity of joints)
v). Material: Glass mat sides and silicone-treated gypsum core
vi). Edge: Square
vii). Rating: Type "X"
viii). Limitations: Maximum ceiling framing not to exceed 12" o.c.

b. Option 2:

i). Mfgr: USG
ii). Product: Securock Glass Mat Sheathing

iii). Size: 5/8" x 4'-0" wide x 4'', 8', 9' and 10' (minimize quantity of joints)
iv). Material: Glass mat sides, Lime Green
v). Edge: Square
vi). Rating: Type "X"

a. Flame Spread: 0
b. Smoke developed: 10 or less

vii). Warranty:
c. 12 months weather exposure
d. Mfgr: 5 year

viii). Limitations: Maximum ceiling framing not to exceed 12" o.c.

2.3 OTHER MATERIALS

A. Accessories: Trim accessories, including, but not limited to:

1. Joint treatment: Refer to Heading 2.04
2. Outside edge:

a. Mfgr: USG
b. Product: DUR-A-BEAD Corner Bead
c. Material: Standard galvanized steel units
d. Model: No.103 1-¼" x 1-¼"

3. Inside corner:

a. Mfgr: USG
b. Product: Sheetrock Brand
c. Material: Paper Faced Metal Trim x 90-degree angle
d. Model: Tape on Trim No. B2

4. Offset Inside corner:

a. Mfgr: USG
b. Product: Sheetrock Brand
c. Material: Paper Faced Metal Trim x greater than 90 degree angle
d. Model: B2 OS

5. "Z" shape trim for edge of board at step back reveal:

a. Mfgr: USG
b. Product: Sheetrock Brand
c. Material: Paper Faced Metal Trim Tape on trim x "Z" profile
d. Model: B4 NB

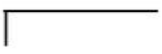
6. "L" shape trim for edge of board at Acoustical tile ceiling:

a. Mfgr: USG
b. Product: Sheetrock Brand
c. Material: Galvanized Metal Trim x "L" shape 90-degree angle
d. Model: No. 200 – B x ½" and/or ⅝"

7. "J" shape trim for edge of board, typical:
    a. Mfgr: USG
    b. Product: Sheetrock Brand
    c. Material: Galvanized Metal Trim
    d. Model: No. 200 – A x ½" and/or ⅝"
8. Control Joint:
    a. Mfgr: USG
    b. Product: Sheetrock Brand
    c. Material: Zinc
    d. Model: No. 093
    e. Profile: ¼" opening x $^{7}/_{16}$" depth x 10'-0" length
9. Wall End Caps:
    a. Mfgr: Flannery,
    b. Product: Drywall End Cap
    c. Model: DWE
        1) Also known as: DMEC, DEC, SWC & 911-EC-xx
    d. Material: Mil Finish Aluminum

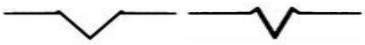


    e. Size:
        1) Widths: (Size to fit field condition)
            a) 3-3/4"
            b) 4-7/8"
        2) Length: 10'-0"
        3) Tape flange: 7/8" wide
10. Drywall "L" trim:
    a. Mfgr: Flannery,
    b. Product: Drywall "L"
    c. Model: DWL
    d. Material: Mil Finish Aluminum



    e. Size:
        1) Width: ¼" thru 4-3/'4"
            a) Size to fit field condition
        2) Length: 10'-0"
        3) Tape flange: 7/8" wide

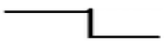
11. "V" Reveal **[Specifier, this mfgr. has a large selection of product to use]**
    a. Mfgr: Flannery
    b. Product: "V" Reveal



    c. Model:
        1) DWV 375 x 3/8" wide reveal
        2) DWV 100 x 1" wide reveal
    d. Material: Mill Finish Aluminum
    e. Size: 10' long

B. Substrate Fasteners
    1. Nails (Wood framing)
        a. Size (1-1/2") (1-3/4")
            1) 11-gauge, hot-dipped galvanized roofing nails with nominal 7/16" diameter head for wood framing.
    2. Screws: (Metal stud framing)
        a. 1" Type S-12 Bugle Head Corrosion-Resistant Screws for application of sheathing to steel studs.
        b. 1-1/4" Type S-12 Pancake Head Corrosion-Resistant Screws for application of self-furring metal lath or brick ties through sheathing to steel studs.

C. Reveals
    1. Mfgr: Fry Reglet (FR)
        a. Alternate: Flannery Trim (FT), www.flannerytrim.com
    2. Product:
        a. Schedule: **[Specifier, there are a great deal of available sizes and models]**

Type	Model	Size	Application
Drywall Reveal 	DRM 625-100 (FR) DWR 625-100 (FT)	5/8" deep x 1" wide	Field Reveal with gyp. Bd. Each side
Drywall "F" Reveal Mold 	DRMF 625-100 (FR) DWRF 625-100 (FT)	5/8" deep x 1" wide	Edge Reveal with gyp. Bd. one side and butt on other side with return reveal lip
Drywall "Z" Reveal Mold 	DWSM 625-100 (FT) DRMZ 625-100 (FR)	5/8" deep x 1" wide	Edge trim with gyp. Bd. one side and butt on other side without return reveal lip

    3. Finish: Mill finish aluminum, painted.
    4. Accessories: Alignment splices

D. Joint Treatment and Skim Coat Treatment - Interior

1. Schedule:

a. Applications:

1) Typical, interior dry conditions, U.N.O

a) Type:

i. Drying: water evaporation type unless application is;

a. In cold weather
a. Required to be Setting Compound by type of tape such as mesh fiberglass
b. Required by application
c. Required by sheathing mfgr.

b) Mfgr: USG
c) Brand: Sheetrock
d) Tape Product: Joint Tape – Heavy
e) Treatment Compound:

i. Product:

a. Initial installation of tape:

i). Product: Taping Compound

b. Secondary and final finishing compound:

i). Product: Toping Compound or Plus Three Compound

c. Skim Coat:

i). Product: Plus Three Compound

2) Interior Face of All Exterior Walls:

a) Substrate: Dens Armour Plus

i. Mfgr: Georgia Pacific

b) Tape Product: Self adhering 10x10 x 2" wide woven glass mesh tape over all joints, inside corners and outside corners

i. Mfgr: Georgia Pacific
ii. Model: ToughRock, Fiberglass mesh tape

c) Treatment Compound:

i. Mfgr: USG
ii. Type: Setting Compound (chemical hardening)
iii. Product: **[Fill in]** _____
iv. Installation: Per manufacturers recommendations
v. Finish: Level 5

a. Includes as herein specified with the entire surface of sheathing skim coated.

3) Wet conditions - Interior: Tile veneer finish

a) Substrate: Dens Shield Tile Backer Board

i. Mfgr: Georgia Pacific

b) Tape Product: Self adhering 10x10 x 2" wide woven glass mesh tape over all joints, inside corners and outside corners

i. Mfgr: Georgia Pacific
ii. Model: ToughRock, Fiberglass mesh tape

c) Treatment Compound:

i. Mfgr: USG
ii. Type: Setting Compound (chemical hardening)
iii. Product: **[Fill in]** _____
iv. Installation: Per manufacturers recommendations

4) Wet conditions - Interior: Non tile veneer finish

a) Substrate: Dens Shield Tile Guard

i. Mfgr: Georgia Pacific

b) Tape Product: Self adhering 10x10 x 2" wide woven glass mesh tape over all joints, inside corners and outside corners

i. Mfgr: Georgia Pacific
ii. Model: ToughRock, Fiberglass mesh tape

c) Treatment Compound:

i. Mfgr: USG
ii. Type: Setting Compound (chemical hardening)
iii. Product: **[Fill in]** _____
iv. Installation: Per manufacturers recommendations
v. Finish: Darby float Skim coat for level 5 finish and paint

5) Damp conditions – Interior: Non-shower areas

a) Substrate: Aqua Tough

i. Mfgr: USG

b) Tape Product: Self adhering 10x10 x 2" wide woven glass mesh tape over all joints, inside corners and outside corners

i. Mfgr: Georgia Pacific
ii. Model: ToughRock, Fiberglass mesh tape

c) Treatment Compound:

i. Mfgr: USG
ii. Type: Setting Compound (chemical hardening)
iii. Product: **[Fill in]** _____
iv. Installation: Per manufacturers recommendations
v. Finish: Darby float Skim coat for level 5 finish and paint

6) Concealed conditions within Access Floor Cavity– Interior:

a) Substrate: Continuation of Gypsum sheathing from above access floor panels
b) Mfgr: Match product used for wall above
c) Brand: Match product used for wall above
d) Tape Product: Match product used for wall above
e) Treatment Compound: Match application used for wall above

7) Ceiling (Soffit) Board - Exterior:

a) Exposed Ceiling (Soffit) Board.

i. Tape Product: Self adhering 10x10 x 2″ wide woven glass mesh tape over all joints, inside corners and outside corners

a. Mfgr: Georgia Pacific
b. Model: ToughRock, Fiberglass mesh tape

ii. Treatment Compound:

a. Mfgr: USG
b. Type: Setting Compound (chemical hardening)
c. Product: **[Fill in]** _____
d. Installation: Per manufacturers recommendations
e. Finish: Darby float Skim coat for level 5 finish and paint

E. Joint Treatment and Skim Coat Treatment – Exterior walls

1. Schedule:

a. Typical conditions

1) Option 1:

a) Application: Underlayment for wall finishes

i. Substrate: Dens Glass™ Fireguard® Type X Exterior Sheathing

a. Mfgr: Georgia Pacific

ii. Tape Product: Self adhering 10x10 x 2″ wide woven glass mesh tape over all joints, inside corners and outside corners

a. Mfgr: Georgia Pacific
b. Model: ToughRock, Fiberglass mesh tape

iii. Treatment Compound:

a. Mfgr: Pecora
b. Type: Latex Sealant
c. Product: AC-20 Acrylic Latex sealant
d. Installation: Per manufacturers recommendations

iv. Fastener treatment: Refer to INSTALLALATION heading

2) Options:

a) Application: Underlayment for wall finishes

i. As herein approved

F. Joint Treatment and Skim Coat Treatment – Exterior Ceilings

1. Schedule:

a. Exposed ceiling board

1) Mfgr: USG
2) Products: Refer to matrix:
3) Matrix of materials and Level of finish:

	Primer – Oil Base	Setting-Type Joint Compounds (Sheetrock Brand) Joint Prefill, Joint Taping, Fill Coat and Finish Coats		
	First Coat	Taping	Durabond®	Easy Sand™
Level 4				
Embedding		■	■	
Fill Coats		■	■	
Finish			■	■
Primer	■			

G. Wall finish, Texture Products and Schedule – Interior & Exterior

1. General: Comply with USG Design Guidelines SA923
2. Finish Schedule:

a. Finish Texture:
[Specifier select if required and/or use Level 5 Smooth wall / Skim coat]

1) Standard Texture:

a) Mfgr: USG
b) Texture designation:

i. Textured walls: Fine Orange Peel
ii. Smooth Wall Level Five: No texture

c) Schedule: At all walls and ceilings, U.N.O
d) Product Schedule:

i. Sealer / Primer:

a. Material: Gypsum board sealer/primer
b. Product: First Coat, Sheetrock brand
c. Application: Spray applied over entire surface Material

ii. Texture:

a. Material: Red Bag Wall Texture
b. Application: Spray applied
c. Coverage: Apply at rate of 20-40 pounds per square foot

2) Smooth Wall / Level 5 – Skim Coat

a) Mfgr: USG

b) Texture Designation: Smooth Wall, Level 5 - Darby
c) Schedule:

i. Locations indicated on Drawings, including , as herein listed:
[Specifier coord. w/ Drawings]

a. Showers without tile veneer
b. Skylight wells
c. Public spaces – walls and ceilings

i). Curved walls
ii). Curved soffits, vertical and horizontal

ii. As herein specified

a. Public spaces – walls and ceilings

i). Lobbies
ii). Corridors
iii). All conditions

d) Product Schedule:

i. Skim Coat – Smooth Wall Level 5

a. Material: Plus Three
b. Application: Steel Trowel applied over entire surface of board.

ii. Sealer /Primer Coat: Level 4 and 5 finish

a. Material: Gypsum board sealer/primer
b. Product: First Coat, Sheetrock brand
c. Application: Spray applied over entire surface
d. Note: This is in addition to painters primer to be installed per Section 09 90 00 – Painting and Coatings.

PART 3 - **EXECUTION**

3.1 INSPECTION/EXAMINATION

A. Verification of Conditions:

1. Examine areas and conditions under which work is to be performed.
2. Identify conditions detrimental to proper or timely completion of work and coordinate with **General Contractor** to rectify.

B. Surface:
1. Examine and verify that receiving conditions of substrate have no defects or errors, which would result in poor or potentially defective application or cause latent defects in workmanship.

3.2 COORDINATION

A. Refer to Division 1 for project coordination requirements.

B. **General Contractor** shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

3.3 PREPARATION

A. Prepare work, substrates, etc. in accordance with manufacturer's recommendations.

3.4 MOCK-UP

A. Erect at location approved by **Architect**.

1. Mock-up shall be part of final construction once approved by **Architect**.
2. Mock-up shall comprise of all components and finishes as specified and indicated in Drawings.

a. Texture
b. Level 5 finish

B. Mock-up

1. Size: 6' x 6'
2. Qty: One (1) each for each wall surface condition and finish

3.5 INSTALLATION

A. General:

1. Perform work in accordance with manufacturer's recommendations, as herein specified and in accordance with drawings.
2. Perform work in accordance with herein listed standards.
3. Install with fiberglass tape at gypsum board requiring it as herein specified and required by mfgr.

B. Sheet arrangement layout: Conform to layouts and requirements indicated; use long sheets to restrict joints to minimum.

1. Edges of sheathing shall not align with the vertical and/or horizontal edges of window and/or door openings.

C. Interior Joints:

1. Perform work in accordance with gypsum board mfgr's requirements and to meet smooth wall and/or textured wall surface
2. Perform work in accordance with gypsum board mfgr's requirements and in accordance with wall veneer including, but not limited to;

a. Tile
b. Stone

D. Exterior Joints:

1. General: Gypsum sheathing:

a. Butt sheets loosely together with tapered edges always placed together. Sand or kerf cut edges and mill ends to provide smooth jointing on exposed face.

1) Stagger end joints.

2. Schedule: Dens Glass™ Fireguard® Type X Exterior Sheathing or approved option as herein approved:
    a. General:
        1) Install in accordance with sheathing manufacturers recommendations and as herein specified.
        4) The surface of framing and furring members to receive sheathing should not very more than 1/4" from the plane of faces of adjacent members.
            a) Make appropriate modifications and/or coordinate with **General Contractor** to meet out of plane criteria.
        5) End joints, if required, should be offset; joints should fit snugly and flashing installed around all openings.
            a) Except vertical joints at expansion conditions.
        6) Panels of the maximum lengths possible should be used to minimize the number of joints.'
            a) Edge joints must be located parallel to and with vertical orientations on framing.
            b) End joints of adjacent lengths of sheathing must be staggered.
            c) Except at expansion joints.
        7) Wood Framing: Sheathing must be attached to wood framing with nails spaced 4" o.c. at perimeter for racking shear resistance, 8" o.c. at perimeter where racking shear resistance is not required, and 8" o.c. along intermediate framing.
        8) Metal Framing: Sheathing must be attached to metal framing with screws spaced 8" o.c. at perimeter and 8" o.c. along intermediate framing.
        9) Fasteners must be driven so as to bear tight against and flush with surface of sheathing.
            a) Fasteners must NOT be countersunk.
        10) Fasteners must be located a minimum of 3/8" from edges and ends of sheathing panels unless approved otherwise by sheathing mfgr..
        11) Where sheathing is used in applications involving veneer systems, any joint treatment required should be in accordance with sheathing manufacturer's instructions and requirements of local governing authorities.
        12) Where sheathing is used in applications of painted ceilings and soffits, joint tape must be applied over joints and embedded in a specified setting type joint compound.
            a) For smooth finish, the surface should be skim coated with joint compound.
    b. Joint treatment:
        1) Schedule:
            a) Typical: (1/8" – 3/8" maximum width)
                i. 1st: Apply glass mesh joint tape to all joints, overlapping at intersections by the width of the tape.
                ii. 2nd: Apply approximately a 3/8" bead of caulk along the joint.
                iii. 3rd: Embed the caulk into the entire surface of the tape with a trowel.
                    a. Use backer rod for openings larger than 1/8"

b) Expansion Joints:

i. Hold edges of sheathing 3/8″ apart.
ii. Install backer rod and sealant at the top of joint 6″ long and at the bottom of the joint 6″ long to ensure no gaps into wall cavity or joint.
iii. Install manufacturer approved primer along length of joint wide enough to extend 2″ past the continuous strip of cold applied self-adhering membrane applied evenly spaced over joint and edge fasteners.

c. Fastener Treatment

1) Schedule:

a) Typical – except for expansion joints

i. Install manufacturer approved sealant over each fastener head and trowel smooth.
ii. Sealant shall be compatible with sheet applied and/or liquid applied vapor barriers and/or water proof membranes.

3. Ceiling Board Exterior gypsum sheathing:

a. Pre-fill joints with Setting-Type Joint compound.
b. Embed Joint Tape in Joint compound.
c. Install Joint compound over zinc, metal trims and beads.
d. Install Joint compound over all fastener heads.
e. Apply finish coats of Setting-Type Joint compound.
f. Skim coat as herein specified for shower ceilings without tile veneer finish.
g. Apply Primer –Sealer prior to texturing.
h. Apply texture
i. Finish paint

E. Typical:

1. Fasteners:

a. Place fasteners 3/8 inch from edges of boards, except when using washers or clips with fasteners in joint.
b. Install fasteners with heads dimpled slightly below surface; do not cut through skin.
c. Space fasteners in accordance with ASTM C840 and manufacturer's recommendations, except as otherwise required by CBC.
d. Install type of fastener and length in accordance with sheathing manufacturer.
e. All ends and edges of all gypsum wallboard shall occur over framing members, except when joints are at right angles to framing members.

2. Ceilings:

a. General:

1. Place boards with long dimension at right angles to supports and end joints occurring over supports.
2. Place perimeters of ceilings and edges of openings over solid bearing members.

b. Maximum joist spacing shall not exceed 12″ O.C.

3. Partitions: Place boards with long dimension either vertical or horizontal (but not combination of both) on studs. Stagger joints on opposite sides of partitions. Locate joints at least 12 inches from jambs of openings. Keep end joints to minimum. Fasten double layer gypsum board as required by code, stagger joints in second layer.
4. Caulking: Using double bead of specified material, install at floors, wall intersections, where walls abut other materials and at all electrical boxes. Install wherever caulking materials is indicated in connection with gypsum board. Apply in accordance with manufacturer's printed directions.
5. Cutting and scribing: Cut neatly to fit around outlets, switch boxes and other protrusions, using keyhole saw or specially designed cutting tool for opening of exact shape and size needed.
6. Trim: Edge exterior corners with bead set to true, plumb line. Where gypsum board joins or abuts any material other than gypsum board, cover end of board with metal casing, leaving joint sufficient for installation of caulking (refer to Article 3.03 F above).

F. Reveals

1. The **General Contractor** shall furnish all labor, materials, services and equipment necessary for, and reasonably incidental to the installation of the reveals as indicated on the contract documents and as herein specified.

   a. Reveals shall be installed with full length pieces and butt joints shall only occur at end conditions.
   b. Install with concealed mechanical fasteners.
   c. Install with prefabricated intersections.

G. Finishing

1. Matrix: Joint treatment and Skim coat treatment:

   a. USG matrix of materials and level of finish

      1) For other products indicated, match that manufacturer's installation recommendations.

		Ready-Mixed Joint Compounds				Drying-Type Joint Compounds				Setting-Type Joint Compounds	
	First Coat	Taping	Topping	All-Purpose	Plus 3	Taping	Topping	All-Purpose	AP Lite	Durabond®	Easy Sand™
Level 0											
Not Used											
Level 1											
Embedding		■		■	■	■		■	■	■	■
Level 2											
Embedding		■		■	■	■		■	■	■	■
Fill			■	■	■		■	■	■	■	■
Level 3											
Embedding		■		■	■	■		■	■	■	■
Fill			■	■	■		■	■	■	■	■

Primer	■										
Level 4											
Embedding		■		■	■	■		■	■	■	■
Fill			■	■	■		■	■	■	■	■
Finish			■	■	■		■	■	■	■	■
Primer	■										
Level 5											
Embedding		■		■	■	■		■	■	■	■
Fill			■	■	■		■	■	■	■	■
Finish			■	■	■		■	■	■	■	■
Skim/Darby				■	■						
Primer	■										

2. Levels Schedule

a. **Levels of Finish.** The following levels of finish are established as a guide for specific final decoration and/or Smooth Wall finish and are a minimum standard for each condition.

1) Level 0:

a) Not Used

1) **Level 1**:

a) Schedule:

i. Plenum areas above ceilings, in attics, in areas where the assembly including, but not limited to;

a. Joints
b. Fastener heads
c. Around all wall penetrations

ii. All joints, exterior angles, reveals and interior angles shall have tape embedded in joint compound.

a. Surface shall be free of excess joint compound.
b. Tool marks and ridges are acceptable.

2) **Level 2**:

a) Schedule:

i. Use where water resistant tile backing board is used as a substrate for tile.
ii. All joints, fasteners, exterior angles, reveals and interior angles shall have fiberglass mesh tape embedded in joint compound and one additional separate coat of joint compound applied over all joints, angles, fastener heads, and accessories. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable.

iii. Primer/Sealer: yes, entire gypsum board surface including treated joints, exterior angles, interior angles, reveals, fasteners, etc. shall be coated with a primer/sealer prior to the application of final finishes.

iv. Gypsum board primer/sealer must be applied as a requirement of this specification section in addition to any and all requirements of primer and paint specified and installed under Section 09 90 00 – Painting and Coatings.

3) **Level 3:**

a) Schedule:

i. Use at conditions where a material will be adhesively applied to gypsum board.

a. Not for use at Tile applications.

ii. Texture: None
iii. Applications: **[Specifier, list applications here]**

a. Where indicated in drawings
b. FRP panel substrate

b) Application:

i. All joints and angles shall have tape embedded in joint compound and wiped with a joint knife leaving a thin coating of joint compound over all joints and angles.

a. Joint compound applied over the body of the tape at the time of tape embedment shall be considered a separate coat of joint compound and shall satisfy the conditions of this level.

ii. All fasteners heads and accessories shall be covered with a coat of joint compound and wiped with a joint knife leaving a thin coating of joint compound.
iii. Surface shall be free of excess compound.
iv. Tool marks and ridges are acceptable.
v. Primer/Sealer: yes, entire gypsum board surface including treated joints, exterior angles, interior angles, reveals, fasteners, etc. shall be coated with a primer/sealer prior to the application of final finishes.

a. Gypsum board primer/sealer must be applied as a requirement of this specification section in addition to any and all requirements of primer and paint specified and installed under Section 09 90 00 – Painting and coatings.

4) **Level 4:**

a) Schedule:

i. Use at all conditions unless noted and/or specified to be Smooth Wall, Level 5 as specified herein, refer to "Level 5 (Smooth Wall) heading and Drawings.
ii. Texture; refer to Heading 2.05 for required texture.

b) Application:

i. All joints, fasteners, exterior angles, reveals and interior angles shall have tape embedded in joint compound and **three** separate coats of joint compound

applied over all joints, fasteners, angles, fastener heads, and accessories. All joint compounds shall be smooth and free of tool marks and ridges. Refer to Heading 2.04 for schedule of specific products.

a. Taping Compound width schedule:

iv). First coat: 8" wide
v). Second coat: 10" wide
vi). Third coat: 12" wide

b. Primer/Sealer: yes, entire gypsum board surface including treated joints, exterior angles, interior angles, reveals, fasteners, etc. shall be coated with a primer/sealer prior to the application of final finishes.

i). Gypsum board primer/sealer must be applied as a requirement of this specification section in addition to any and all requirements of primer and paint specified and installed under Section 09 90 00 – Painting and Coatings.

c) Limitations:

i. At un-backed vinyl wall covering apply a Level 5 finish to wall substrate

5) **Level 5: (Smooth Wall / Skim Coat)**

a) Schedule:

i. Use this level of finish at:

a. All locations herein listed (walls, ceilings and soffits)
b. All locations with G.P. Dens Armour Plus sheathing
c. All locations herein listed as indicated in drawings, including but not limited to;

i). Curved Walls
ii). Shower Ceilings without tile veneer
iii). Conference rooms
iv). Lobbies
v). Corridors.
vi). Shower ceilings without tile veneer
vii). All Barrel vaulted ceilings
viii). Other locations indicated on Drawings **[Specifier coordinate]**
ix). Locations herein specified

d. All High gloss painted surfaces

b) Application:

i. All joints, fasteners, exterior angles, reveals and interior angles shall be embedded in joint compound and three separate coats of specified compound applied over these conditions and one final "Skim Coat" of specified compound trowel applied over entire surface of gypsum board.

a. Taping Compound width schedule:

i). First coat: 8" wide

ii). Second coat: 10" wide
iii). Third coat: 12" wide
iv). Fourth: 12" wide to both sides of "Third coat"
v). Skim coat: Entire surface of board.

b. The thin "Skim Coat" of specified compound shall be applied to the entire gypsum board surface after the three separate applications of tapping compound have been installed at all joints, fasteners, exterior angles, reveals and interior angles.

i). Sand only taped joints prior to application of thin skim coat.
ii). Skim coat shall be applied prior to any sanding of non-taped board surface

c. Skim coat must be applied with a "Darby" steel trowel or knife blade.

i). Install mud to thickness as required to fill imperfections in surface using "Darby" method to fill surface up to ¼" in thickness.
ii). Use a minimum 4'-0" wide blade.

d. The surface shall be smooth and free of tool marks and ridges.

ii. Primer/Sealer: yes, entire gypsum board surface including treated joints, exterior angles, interior angles, reveals, fasteners, etc. shall be coated with a primer/sealer prior to the application of final finishes.

a. Gypsum board primer/sealer must be applied as a requirement of this specification section in addition to any and all requirements of primer and paint specified and installed under Section 09 90 00 – Painting and Coatings.

3.6 PROTECTION AND CLEAN UP

A. Refer to Division 1 for protection and cleaning requirements.

B. Subcontractor will keep the work areas in a clean and safe condition so his rubbish, waste, and debris do not interfere with the work of others.

C. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.

1. Clean adjacent surfaces free of caulking or sealant with mechanical action or solvent as necessary, avoiding damage to other materials.

D. Perform work in accordance with manufacturer's recommendations, as herein specified and in accordance with drawings.

E. In the event of damage, immediately make all repairs and replacements necessary to the approval of the **Architect** and at no cost to the **Owner**.

F. After completion of work in this section, remove all erection equipment and implements of service, and debris.

1. Leave entire area in a neat, clean, acceptable condition.

G. Provide Guarantee/Warranties and Bonds as required in this specification section and as listed in Division 1 closeout submittal procedures.

H. Provide record drawings in accordance with Division 1 closeout submittal procedures.

I. Close out, on-site inspection will be at the discretion of the **Architect** after he receives the **General Contractor's NOTICE** of "Certificate of Substantial Completion".

END SECTION 09 29 00

SECTION 09 91 13 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
   1. Surface Preparation.
   2. Field application of paints, stains, varnishes, and other coatings (PTG, PTS).

1.3 SUBMITTALS

1. Product data - Submit product data sheets for each product.
2. Samples:
   a. Submit three painted samples (brush outs), illustrating selected colors and textures for each color and systems selected with specified coats cascaded.
   b. Submit on suitable backing, 8x10 inch size.

1.4 QUALITY ASSURANCE

A. Reference Standards:
   1. Title 19 CCR, Public Safety, State Fire Marshall Regulations
   2. Title 24 CCR, Part 1 - 2022 Building Standards Administrative Code
   3. Title 24 CCR, Part 2 - 2022 California Building Code, VOL. 1&2 (CBC) (2018 IBC, as Amended by CA
   4. Title 24 CCR, Part 3 - 2022 California Electrical Code (CEC) (2017 NEC, as Amended by CA)
   5. Title 24 CCR, Part 4 - 2022 California Mechanical Code (CMC) (2018 IAPMO UMC, as Amended by CA)
   6. Title 24 CCR, Part 5 - 2022 California Plumbing Code (CPC) (2018 IAPMO UPC, as Amended by CA)
   7. Title 24 CCR, Part 9 - 2022 California Fire Code (CFC) (2018 IFC, as Amended by CA
   8. Title 24 CCR, Part 10 - 2022 California Existing Building Code
   9. Title 24 CCR, Part 12 - 2022 California Reference Standards (Partial List)

10. 2010 ADA Standards for Accessible Design
11. Americans with Disabilities Act (ADA), Title II or Title III.

1.5 DELIVERY, STORAGE, AND PROTECTION

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

C. Environment Requirements:
1. Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be stored and applied.
2. Stucco: Provide a PH test of the stucco that shows compliance with PH requirements of the paint manufacturer. Do not apply paint to stucco at PH levels over 10 or the max amount recommended by the paint manufacturer, whichever is less.
3. Do not paint when there is a threat of rain within 24 hours or when surface or air temperatures are at or below 40 degrees.
4. Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Coatings Suggested Control measure, as shown in Table 5.504.4.3, unless more stringent local limits apply. The VOC Content limit for coatings that do not meet the definitions for specialty coatings categories listed in Table 5.504.4.3 shall be determined by classifying the coating as a Flat, Non-flat or non-flat high gloss coating based on its gloss, as defined in Subsections 4.21, 4.36 and 4.37 of the 2007 California Air Resources Board, suggested Control Measure, and the corresponding Flat, Non-flat or Non-flat-High gloss VOC limit on Table 5.504.4.3 shall apply. *"TABLE 5.504.4.3-VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS"*

Aerosol paints and coatings shall meet the PWMIR Limits for ROC in Section 94522(a)(3) and other requirements, including prohibitions on the use of certain toxic compounds and ozone depleting substances. In Sections 94522(c)(2) and (d)(2) of the California Code of Regulations, Title 17, commencing with Section 94520 and in areas under the jurisdiction of the Bay Area Air Quality

Management District, (additionally) comply with the percent VOC by weight of product limits of Regulation 8 Rule 49. *"TABLE 5.504.4.3-VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS"*

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace paint that fails in materials or workmanship within specified warranty period.
   1. Warranty Period: 1 year.

B. Installer Warranty: 1 year.

1.8 EXTRA STOCK

A. Provide following with District's permission:
   1. Minimum 2 gallons of each product and each color in an original unopened or new 1 gallon cans.
      a. Color spot each lid.
      b. Identify with formula, location, product and date on the lid.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Paints:
   1. Sherwin Williams Pomar 200 (Basis of Design for VOC, color and quality).
   2. Frazee Paints
   3. Dunn-Edwards.
   4. ICI.
   5. Or equal (Reference substitution requirements in Section 01 60 00)

2.2 PAINTS AND COATINGS

A. Ready mixed, except field-catalyzed coatings.

B. Prepare pigments:
   1. To a soft paste consistency, capable of being readily and uniformly dispersed to a homogenous coating.
   2. For good flow and brushing properties.
   3. Capable of drying or curing free of streaks or sags.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application. Do not proceed unless substrate is suitable.

C. Test shop-applied primer for compatibility with subsequent cover materials.

D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Plaster and Gypsum Wallboard: 12 percent.
   2. Interior Wood: 15 percent, measured in accordance with ASTM D-4442.
   3. Exterior Wood: 15 percent, measured in accordance with ASTM D-4442.

3.2 PREPARATION OF SURFACE

A. General:
   1. Clean all exterior walls and surfaces of loose and scaly paint, dirt, dust, chalk, and other foreign matter by water-blasting using care not to damage substrate followed by hand scraping, sanding or wire brushing after surfaces are dry. Mildew must be treated with household bleach solution and rinsed thoroughly.
   2. Patch, caulk, set protruding nails and repair all surfaces and cracks where necessary with suitable patching materials and smooth off to match adjacent surfaces.
   3. Sand Glossy surfaces to dull surface and remove residue.
   4. Remove mildew from affected surfaces with a solution of Tri-Sodium Phosphate and bleach. Rinse with clean water and allow to dry completely.
   5. Existing surfaces to be recoated shall be thoroughly cleaned and de-glossed by sanding or other means prior to priming and painting. Patched and bare areas shall be spot primed with the same primer as specified for new work.
   6. Rusty metal: Scrape, sand or wire wheel, feathering edges to sound coating. Dust surfaces. Topcoat.
   7. Remove soil and body oils completely from surfaces, including handrails, door edges and posts. Treat with Liquid Sandpaper or Dull-N-Bond.
   8. Remove hardware, accessories, plates, fixtures and similar items not to be finished. Reinstall at completion.
   9. Paint edges of sink cut-outs.

B. Galvanized Surfaces: Remove all oils and contamination from galvanized surfaces scheduled to be painted by washing with a compliant solvent wash.

C. Ferrous Metal: Remove grease, rust, scale, dirt and dust from ferrous metal surfaces. Primer coat shall be applied not less than 30 minutes, nor more than 3 hours after preparation of surface.

D. Primed Metal: Sand and scrape shop primed metal to remove loose primer and rust. Touch-up bare, abraded and damaged areas with metal primer. Feather edges to make touch-up patches inconspicuous.

E. Wood Surfaces:
1. Remove dust, grit and foreign matter from wood surfaces. Sand surfaces and dust clean. Spot prime knots, pitch streaks and sappy sections with a stain blocking primer where surfaces are to be painted. Fill nail holes, cracks and other defects after priming and spot prime repairs after patching material has fully cured.
2. Wood surfaces with peeling areas are to have edges of broken paint film sanded to a feather edge.
3. Back prime wood trim. Paint tops, bottoms, edges and cut-outs of doors.

F. Plaster Surfaces:
1. Plaster surfaces shall be dry and free from efflorescence, encrustations and foreign matter. Fill cracks, holes and imperfections, smoothing repairs to match adjacent texture. Allow repairs to fully cure before priming.
2. Prime plaster surfaces with specified primer. Caulk all cracks.

G. Gypsum Board: Gypsum board shall be dusted clean and free from encrustations and other foreign matter.

H. Preparation of other surfaces shall be performed following specific recommendations of the coating manufacturer.

3.3 APPLICATION

A. Apply products in accordance with manufacturer's instructions.

B. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance. Apply each coat of paint slightly darker than preceding coat unless otherwise approved

E. Sand wood surfaces lightly between coats to achieve required finish.

F. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust particles just prior to applying next coat.

G. Stipple all edges and corners to conceal brush marks.

H. Doors: Paint entire door unless otherwise noted, including door top and bottom edge surfaces.

I. Paint entire trim element. Painting of faces only is unacceptable. Trim surfaces must be wrapped with the trim color and not "faced off" or "Hollywooded".

J. Tinting: Tint each primer a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint primer to match the color of the finish coat, but provide sufficient differences in shade of primer to distinguish each separate coat.

3.4 PROTECTION

A. Protect work of other trades and items not intended to receive paint. Install "wet paint" signs to protect newly painted surfaces.

3.5 CLEANING

A. Protection - Carefully protect areas where work is in progress from damage.
   1. Provide and spread clean drop cloths when and where required to provide the necessary protection.
   2. Immediately clean-up all accidental spatter, spillage, misplaced paint and restore the affected surface to its original condition.

B. Clean-up:
   1. At completion of work, remove all materials, supplies, debris and rubbish and leave each area in a clean, acceptable condition.
   2. Collect waste material which may constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.6 SURFACES TO BE FINISHED

A. Paint all new work and areas affected by new work, unless noted otherwise.

B. Do not paint or finish the following items:
   1. Items fully factory-finished unless specifically noted.

2. Fire rating labels, equipment serial number and capacity labels.

C. Mechanical and Electrical: Use paint systems defined for the substrates to be finished.
1. Paint all insulated and exposed pipes occurring in finished areas to match background surfaces, unless otherwise indicated.
2. Paint shop primed items occurring in finished areas.
3. Paint interior surfaces of air ducts and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint.
4. Paint dampers exposed behind louvers, grilles and convector and baseboard cabinets to match face panels.

3.7 PAINT SYSTEMS – EXTERIOR

Satin *(#B33W200) Semi-gloss (#B35W200) Hi-Gloss, (#B35W200)*

A. Paint New Plaster/Stucco, Cement Siding, Shingles, Common Brick and Concrete Walls, Low Sheen (Satin) Finish. 3 coat:
1. 1st Coat: S-W Loxon Concrete & Masonry Primer Sealer, A24W0300 (8 mils wet, 3.2 mils dry).
2. 2nd Coat: S-W #A89W00507 *(#B33W200)* Acrylic Low sheen (4 mils wet, 1.5 mils dry per coat)
3. 3rd Coat: S-W #A89W00507 *(#B33W200)* Acrylic Low sheen (4 mils wet, 1.5 mils dry per coat)

B. Paint New Plaster/Stucco, Cement Siding, Shingles, Common Brick and Concrete Walls,
1. 1st Coat: S-W Loxon Concrete & Masonry Primer Sealer, A24W0300 (8 mils wet, 3.2 mils dry).
2. 2nd Coat: S-W #B35W200 Acrylic Hi-Gloss (4 mils wet, 1.5 mils dry per coat)
3. 3rd Coat: S-W #B35W200 Acrylic Hi-Gloss (4 mils wet, 1.5 mils dry per coat)

C. Paint New Plaster/Stucco, Cement Siding, Shingles, Common Brick and Concrete Walls, Hi-gloss Finish. 3 coats:
1. 1st Coat: S-W Loxon Concrete & Masonry Primer Sealer, A24W0300 (8 mils wet, 3.2 mils dry).
2. 2nd Coat: S-W #B35W200 Acrylic Hi-Gloss (4 mils wet, 1.5 mils dry per coat)
3. 3rd Coat: S-W #B35W200 Acrylic Hi-Gloss (4 mils wet, 1.5 mils dry per coat)

D. Paint New Plaster/Stucco, Cement Siding, Shingles, Common Brick and Concrete Walls, Low Sheen (Satin) Finish. 3 coat:
1. 1st Coat: S-W Loxon Concrete & Masonry Primer Sealer, A24W0300 (8 mils wet, 3.2 mils dry).
2. 2nd Coat: S-W #B33W200 Acrylic Low sheen (4 mils wet, 1.5 mils dry per coat)
3. 3rd Coat: S-W #B33W200 Acrylic Low sheen (4 mils wet, 1.5 mils dry per coat)

E. Paint New Wood Satin Finish, Latex, 3 coat:
   1. 1st Coat: S-W Exterior Latex Wood Primer, B42W8041 (4 mils wet, 1.4 mils dry).
   2. 2nd Coat: S-W #B33W200 Latex Satin, (4 mils wet, 1.52 mils dry per coat).
   3. 3rd Coat: S-W #B33W200 Latex Satin, (4 mils wet, 1.52 mils dry per coat).

F. Paint New Unpainted Masonry Satin Finish, Latex, 3 coat:
   1. 1st Coat: S-W Exterior Acrylic Masonry Primer, A24W00300 (50-100 sq ft/gal).
   2. 2nd Coat: S-W Super Paint Exterior Acrylic Latex Satin Finish. A89W00507 (4 mils wet, 1.52 mils dry per coat
   3. 3rd Coat: S-W Super Paint Exterior Acrylic Latex Satin Finish. A89W00507 (4 mils wet, 1.52 mils dry per coat

G. Paint New Unpainted CMU Satin Finish, Latex, 3 coat:
   1. 1st Coat: S-W Heavy Duty Acrylic Block Filler Primer, B42W00046 (50-100 sq ft/gal).
   2. 2nd Coat: S-W Super Paint Exterior Acrylic Latex Satin Finish. A89W00507 (4 mils wet, 1.52 mils dry per coat
   3. 3rd Coat: S-W Super Paint Exterior Acrylic Latex Satin Finish. A89W00507 (4 mils wet, 1.52 mils dry per coat

H. Paint New Wood, Satin Finish. Acrylic Latex, 3 coat:
   1. 1st Coat: S-W A-100 Exterior Oil Wood Primer, Y24W00020 (8 mils wet, 3.2 mils dry).
   2. 2nd Coat: S-W S-W Super Paint Exterior Acrylic Latex Satin Finish. A89W00507 (4 mils wet, 1.52 mils dry per coat
   3. 3rd Coat: - S-W Super Paint Exterior Acrylic Latex Satin Finish. A89W00507 (4 mils wet, 1.52 mils dry per coat).

I. Stain New Wood Siding, Shingles (non-roof) and Trim, Semi-Transparent, 2 coat:
   1. 1st Coat: S-W Woodscapes Exterior Polyurethane Semi-Transparent Stain A15W00211
   2. 2nd Coat: S-W Woodscapes Exterior Polyurethane Semi-Transparent Stain A15W00211

J. Stain New Wood Siding, Shingles (non-roof) and Trim, Opaque Finish, 2 coat:
   1. 1st Coat: S-W Woodscapes Exterior Polyurethane Semi-Transparent Stain A15W00211
   2. 2nd Coat: S-W Woodscapes Exterior Polyurethane Semi-Transparent Stain A15W00211

K. Paint Ferrous Metals Semi-Gloss, Acrylic, 3 coat:
   1. 1st Coat: S-W Kem-Bond HS Universal Metal Primer (Off White) B50WZ0004 (5.0 mils wet, 2.0 mils dry). *(If pre Primed: Show compatibility of primer and this coat can be deleted.)*

2. 2nd Coat: S-W DTM Acrylic Coating Semi-Gloss, B66W00211 (4 mils wet, 1.5 mils dry per coat).
3. 3rd Coat: S-W DTM Acrylic Coating Semi-Gloss, (4 mils wet, 1.5 mils dry per coat).

L. Paint New Galvanized Metals, Semi-Gloss, Acrylic, Latex 2 coat:
1. 1st Coat: Jasco Metal Etch (5.0 mils wet, 2.0 mils dry).
2. 2nd Coat: S-W DTM Acrylic Coating Semi-Gloss, B66W00211 (4 mils wet, 1.5 mils dry per coat).
3. 3rd Coat: S-W DTM Acrylic Coating Semi-Gloss, (4 mils wet, 1.5 mils dry per coat).

M. Elastomeric Coating:
1. 1st Coat - S-W, VIP
2. 1st and 2nd Coats: Minimum (2 mil each coat)

3.8 PAINT SYSTEMS -INTERIOR

A. Paint New – Wood, Trim, Doors, Composite Wood Panels, Semi-gloss Latex, 3 coat:
1. 1st Coat: Pro-Mar white lacquer Undercoater White B44WT0001
2. 2nd Coat: S-W ProMar 200 Interior Latex, Semi-Gloss, Extra white B31W02251. (4 mils wet, 1.3 mils dry per coat)
3. 3rd Coat: S-W ProMar 200 Interior Latex, Semi-Gloss, Extra white B31W02251. (4 mils wet, 1.3 mils dry per coat)

B. Paint Ferrous Metals Semi-Gloss, Acrylic, 3 coat:
1. 1st Coat: S-W Kem-Bond HS Universal Metal Primer (Off White) B50WZ0004 (5.0 mils wet, 2.0 mils dry). *If pre-Primed: Show compatibility of primer and this coat can be deleted.*
2. 2nd Coat: S-W DTM Acrylic Coating Semi-Gloss, B66W00211 (4 mils wet, 1.5 mils dry per coat).
3. 3rd Coat: S-W DTM Acrylic Coating Semi-Gloss, (4 mils wet, 1.5 mils dry per coat

C. Paint New Gypsum Board (All Areas except Public Areas , Restrooms and wet Areas) Satin Finish - Latex, 3 coat:
1. 1st Coat: S-W Pro High Holdout Primer, B28WY2000 Series (5.0 mils wet, 2.0 mils dry)
2. 2nd Coat: S-W ProMar 200 Interior Latex Lo-Sheen ES Enamel Extra White, (4 mils wet, 1.7 mils dry per coat).
3. 3rd Coat: S-W ProMar 200 Interior Latex Lo-Sheen ES Enamel Extra White, (4 mils wet, 1.7 mils dry per coat).

D. Paint New Gypsum Board (Public Areas , Restrooms and wet Areas)Semi-Gloss Finish - Latex, 3 coat:

1. 1st Coat: S-W Pro High Holdout Primer, B28WY2000 Series (5.0 mils wet, 2.0 mils dry)
2. 2nd Coat: S-W ProMar 200 Interior Latex Semi-Gloss Extra White, B20W011251 (4 mils wet, 1.7 mils dry per coat).
3. 3rd Coat: S-W ProMar 200 Interior Latex Semi-Gloss Extra White, B20W011251 (4 mils wet, 1.7 mils dry per coat).

E. Paint New Plaster/ Concrete (Public Areas , Restrooms and wet Areas) Semi-Gloss Finish - Latex, 3 coat:
1. 1st Coat: PrepRite Classic Interior Latex Primer, B28W00101 (5.0 mils wet, 2.0 mils dry)
2. 2nd Coat: S-W ProMar 200 Interior Latex Semi-Gloss Extra White, B31W02251 (4 mils wet, 1.7 mils dry per coat).
3. 3rd Coat: S-W ProMar 200 Interior Latex Semi-Gloss Extra White, B31W02251 (4 mils wet, 1.7 mils dry per coat).

F. Paint New Galvanized Metals, Semi-Gloss, Acrylic, Latex 2 coat:
1. 1st Coat: Jasco Metal Etch (5.0 mils wet, 2.0 mils dry).
2. 2nd Coat: S-W DTM Acrylic Coating Semi-Gloss, B31W02251 (4 mils wet, 1.5 mils dry per coat).
3. 3rd Coat: S-W DTM Acrylic Coating Semi-Gloss, B31W0225 (4 mils wet, 1.5 mils dry per coat).

3.9 COLORS

A. To be selected by Architect from Manufacturers standard color palette and as scheduled on the “Finish Schedule” provided in the plans.

END OF SECTION 09 91 00

SECTION 26 05 00
GENERAL REQUIREMENTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK:

A. The work of this Section consists of providing all required labor, supervision, materials and equipment (except equipment furnished by the Owner to be installed by the Contractor) to satisfactorily complete the work shown on the drawings and/or specified in all Sections of Division 26 and all other work and miscellaneous items, not specifically mentioned, but reasonably inferred for a complete and fully operating facility. The work shall include but not be limited to the following:
   1. Furnish and install all required in-place equipment, conduits, conductors, cables and any miscellaneous materials for the satisfactory interconnection and operation of all associated electrical systems.

1.2 RELATED WORK:

A. This Section provides the basic Electrical Requirements which supplement the General Requirements of Division 1 and apply to all Sections of Division 26.

1.3 STANDARDS AND CODES:

A. All work and material shall be in compliance with and according to the requirements of the latest revision of the following standards and codes:
   1. California Electrical Code (CEC)
   2. National Fire Protection Association (NFPA):
      a. 70 National Electrical Code (NEC)
   3. American National Standards Institute (ANSI) Publications:
      a. C2-02 National Electrical Safety Code
   4. Code of Federal Regulations (CFR):
      a. 29 CFR 1910.147 Control of Hazardous Energy (Lock Out/Tag Out)
   5. Electronics Industries Association / Telecommunications Industries Association (EIA / TIA)
   6. Institute of Electrical and Electronics Engineers (IEEE)
   7. National Electrical Testing Association (NETA):
      a. Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems, Standard ATS
   8. National Electrical Manufacturers Association (NEMA)
   9. Occupational Safety and Health Act (OSHA) Standards
   10. State of California Public Utilities Commission:
      a. General Order 128 Rules for Construction of Underground Electric Supply and Communication Systems
   11. Variances: In instances where two or more codes are at variance, the most restrictive requirement shall apply.

12. Underwriter Laboratories (UL) listing is required for all equipment and materials where such listing is offered by the Underwriters Laboratories. Safety labeling and listing by other organizations, such as ETL Testing Laboratories, may be substituted for UL labeling and listing if acceptable to the Owner. Provide service entrance labels for all equipment required by the NEC to have such labels.

1.4 SUBMITTALS:

A. As specified in Division 1. Submit to the Engineer shop drawings, manufacturer's data and certificates for equipment, materials and finish, and pertinent details for each system specified. Obtain approval before procurement, fabrication, or delivery of the items to the job site. Partial submittals are not acceptable and will be returned without review.

B. Submittals are required for all items, regardless of whether they are furnished as specified or are substituted.

C. Submittals shall be provided prior to the purchasing and installation of the item(s) being submitted. Any work done prior to the final approval of the submittal shall be done at risk and any modifications, changes, or re-work that may be required resulting from the final submittal review shall be provided by the Contractor at no additional cost to the project.

D. Information to be submitted includes manufacturer's name, trade name, equipment model number, nameplate data, equipment drawings including: size, layout dimensions and capacity, manufacturer's descriptive literature of cataloged products, diagrams, fault and coordination study, seismic calculations, test data, and performance and characteristic curves as applicable. Furnish project specification and paragraph reference, applicable Federal, Industry and Technical Society Publication References, and years of satisfactory service of each item required to establish contract compliance. Photographs of existing installations and data submitted in lieu of catalog data are not acceptable and will be returned without approval.

E. If submittal information includes multiple products, items being submitted for approval shall be clearly identified and Items not to be used on the project shall be clearly marked out. Submittals consisting of manufacturer's catalogs without clearly marking out items not being used will be returned as not reviewed.

F. Organize submittals for equipment and items related to each specification section together as a package.

G. Submit submittal packages in digital PDF format.

1. Certificates of Conformance: Submit manufacturer's certifications as required on products, materials, finish, and equipment indicated in the technical sections. Certifications shall be documents prepared specifically for this contract. Preprinted certifications and copies of previously submitted documents will not be acceptable. The manufacturer's certifications shall name the appropriate products, equipment, or materials and the publication specified as controlling the

quality of that item. Certification shall not contain statements that imply the item does not meet requirements specified, such as "as good as", "achieve the same end use and results as materials formulated in accordance with the referenced publications;" or "equal or exceed the service and performance of the specified material." Certifications shall state that the item conforms to the requirements specified. Certificates shall be printed on the manufacturer's letterhead and shall be signed by the manufacturer's official, authorized to sign certificates of conformance.

H. Substitutions:
   1. The equipment included in the Contract Documents is used to establish standards of quality, utility, size, and appearance. Equipment which in the opinion of the Engineer is equal in quality, utility, size, and appearance will be approved as substitutions to that specified.
      a. Products that are specified by manufacturer, trade name or catalog number establish a standard of quality and do not prohibit the use of equal products of other manufacturers provided they are approved by the Engineer prior to bidding.
   2. Substitutions will be accepted for review where there is a reasonable reason for the substitution. Reasonable reasons include:
      a. Cost savings to the Owner. Include deductive change order with submittal.
      b. A product with features providing additional benefits to the end user.
      c. Improved finished environment, lay out of the final installation, or space savings over the specified equipment.
      d. Delivery considerations.
      e. Owner's specific requests.
   3. Where items are noted as "or equal", a product of equal design, construction and performance will be considered.
   4. Any item proposed as a substitute shall be accompanied by the following:
      a. Drawings and/or data giving sizes, capacities, all pertinent test data, catalog cut sheets, product information, and all other necessary information required to substantiate that the product is equal or exceeds that specified.
      b. A summary sheet noting each performance characteristic noted in the specification section or elsewhere in the contract documents of the specified product and the corresponding performance characteristics of the proposed substitution. The summary sheet shall contain the following information:
         1) Reason for Substitution Request
         2) Pertinent Performance Characteristics
         3) Specified Product Values
         4) Substituted Product Values
      c. Any substitution request that does not include the above information shall be rejected.

d. Refer to the end of this specification section for an example form to be used for substituted products. A Microsoft Word version of the form can be provided to the Contractor for their use upon request.

5. Substitutions shall be equal, in the opinion of the Engineer, to the specified equipment. The burden of proof of such shall rest with the Contractor. When the Engineer in writing accepts a substitution, it is with the understanding that the Contractor guaranteed the substituted equipment to be equal to the one specified and dimensioned to fit within the construction. Approved substitutions shall not relieve the Contractor of responsibilities for the proper execution of the work, or from any provisions of the Plans or Specifications.
6. Contractor shall be responsible for coordination of the substituted products with other trades. Provide all additional connectivity, equipment, increased wire/conduit size, installation hardware, testing, and other miscellaneous appurtenances as required for a complete and fully functional installation.
7. Only one substitution will be considered for each product specified.
8. Alternate manufacturers must be submitted for approval 10 days prior to bid date unless noted otherwise in Division 1.
9. The Contractor shall be responsible for all expenses in connection with the substitution materials, process, and equipment, including the effect of his/her substitution on him/her, his/her sub-Contractor's or other Contractor's work. No substitution shall be permitted without written authorization of the Engineer. Any assumptions on the acceptability of a proposed substitution prior to acceptance by the Engineer are at the sole risk of the Contractor.

I. Change Orders:
1. Where a change to the contract documents would result in a credit due to the Owner or a value add change to the project, provide a detailed change order request for the Engineer to review.
2. It shall be understood that the Engineer's review of costs associated with the change order shall not constitute approval of the change order or their associated costs. The Engineer's review shall be intended to assist the Owner in evaluating the costs associated with the change only. Final approval or rejection of the change order shall be at the discretion of the Owner.
3. Change order requests shall include the following information:
   a. Description of the change
   b. Reference to the document or written direction to make the change:
      1) In the case of design-team directed changes, reference the drawing/sketch number or RFI number.
      2) In the case of Owner-directed changes, reference the email, memo, or other written direction from the Owner and provide a copy of the direction.
   c. Detailed cost breakdown for the change:

1) Line item for each material noting:
   (a) Material used (e.g. ¾" EMT)
   (b) Total quantity (e.g. 200lf)
   (c) Unit cost (e.g. $2/lf)
   (d) Total materials cost (e.g. $400)
   (e) Unit labor hours (e.g 6hrs/100lf)
   (f) Total labor hours (e.g. 12hrs)
   (g) Hourly rate (e.g. $90/hr)
   (h) Total labor cost (e.g. $1,080
2) Total labor hours for each position (e.g. Journeyman vs. Superintendent)
3) Total materials cost
4) Overhead
5) Profit
6) Total change order value (positive for value added changes, negative for credits)

J. Closeout Submittals:
   1. As-built drawings: Submit As-Built Record documents as in accordance with section 3.05 below.
   2. Cost analysis: Submit final cost information including original bid and any change orders broken down by system, material and labor costs (as applicable):
      a. Power distribution
      b. Lighting and lighting controls
      c. Low Voltage systems
   3. Operation and Maintenance Manuals: Furnish O & M Manuals for equipment where manuals are specified in the equipment specifications or are specified in Division 1. Electrical O & M Manuals shall be provided in a single transmittal and shall include as a minimum:
      a. Copies of equipment supplied on the project.
      b. Instruction manuals including operation instructions and maintenance requirements/recommendations.
      c. List of suppliers for all equipment with addresses and telephone numbers.
      d. List of service support for all equipment with addresses and telephone numbers.
      e. Copies of all test reports required in Division 26 specification sections.
      f. Spare Parts: For each piece of equipment, submit a list of recommended spare parts. Include part numbers and the name, address, and telephone number of the supplier.
      g. Other closeout documentation and test results as required under other sections of the specifications.
      h. Warranty for all work, equipment, and systems, including Contractor's general warranty.

i. All warranties begin as per the Contract, Division 1 or final acceptance of the Work by the Owner, Architect, Engineer, and Authority Having Jurisdiction, which ever is later.
   1) Lamps, drivers, and ballasts are to be covered as per specification 26 51 00.
   2) Manufacturer's Warrantees and Guarantees that are longer than the base contract/specified amount are to be provided with the manuals.
   3) The Contractor is responsible for all Warranty and Guarantee work whether or not the Manufacturer also Warrantees and Guarantees the product.

1.5 CONTRACT DOCUMENTS:

A. Review the Drawings and Specification Divisions of other trades and perform the electrical work that will be required for the installations.
   1. Should there be a need to deviate from the Electrical Drawings and Specifications, submit written details and reasons for all changes to the Engineer for favorable review.
   2. All drawings and divisions of these specifications shall be considered as whole. This Contractor shall report any apparent discrepancies prior to submitting bids.
   3. Should there be a conflict or discrepancy between the drawings and specifications, or between different drawings sheets, or between different specification sections, the most expensive option shall be required, at the discretion of the Engineer.

B. Drawings:
   1. The Drawings shall govern the general layout of the completed construction:
      a. Locations of equipment, inserts, anchors, panels, pullboxes, manholes, conduits, stub-ups, fittings, power and convenience outlets, lighting fixtures and ground connections are approximate unless dimensioned; verify locations with the Engineer prior to installation. Field verify scaled dimensions on Drawings.
      b. The general arrangement and location of existing conduits, piping, apparatus, etc., is shown as existing on drawings or specified. The drawings and specifications are for the assistance and guidance of the Contractor, exact locations, distances and elevations are governed by actual field conditions. Extreme accuracy of data given herein and on the drawings is not guaranteed. Minor changes may be necessary to accommodate work. The Contractor is responsible for verifying existing conditions. Should it be necessary to deviate from the design due to interference with existing conditions or work in progress, claims for additional compensation shall be limited to those for work required by unforeseen conditions as determined by the Engineer.

1.6 COORDINATION:

A. Coordinate the electrical work with the other trades, code authorities, utilities and the Engineer:
   1. Failure to accomplish this coordination is not a basis for additional cost reimbursement to the Contractor.
   2. Coordinate does not mean to only send a Request For Information. Coordinate implies that the Contractor is to take the lead in bringing all of the necessary organizations together to coordinate the work and to provide for the associated costs.

B. Where connections must be made to existing installations, properly schedule all the required work, including the power shutdown periods. Schedule and carry out shutdowns so as to cause the least disruption to operation of the Owner's facilities:
   1. Include costs for work during non-normal working hours and temporary facilities as may be required.
   2. Include costs as necessary for sub-Contractors as necessary to accomplish the specified work.

C. When two trades join together in an area, make certain that no electrical work is omitted. Failure to accomplish this coordination is not a basis for additional cost reimbursement to the Contractor.

D. Operations:
   1. Perform all work in compliance with Division 1:
      a. Keep the number and duration of power shutdown periods to a minimum.
      b. All shutdowns which would interfere with the operations of Owner's equipment or facilities shall be coordinated with the Owner a minimum of 15 days in advance.
         1) Where Owner's equipment or facilities must remain operational during the shutdown, provide sufficient means to temporarily backup the interrupted services for the duration of the interruption.
      c. Show all proposed shutdowns and their expected duration on the construction schedule.
         1) If the construction schedule is created and maintained by others, make sure that the associated information is incorporated.
         2) Failure by the Contractor to properly schedule and plan for such activities is not a basis for additional compensation.
      d. Carry out shutdown only after the Engineer has favorably reviewed the schedule. Submit power/communications interruption schedule 15 days prior to date of interruption. Failure to provide schedule with adequate review time may result in rescheduling of the work at the Contractor's expense.

E. Construction Power:
   1. See Division 1 Temporary Facilities and Controls.

F. Storage:
   1. Provide adequate storage for all equipment and materials which will become part of the completed facility so that it is protected from sun, weather, condensation, dust, water, or construction operations.

G. Damaged Products:
   1. Notify the Engineer in writing in the event that any equipment or material is damaged. Obtain approval from the Engineer and Manufacturer before making repairs to damaged products.

H. Order material in such a timely manner and after approval of the same so as to insure that the approved material is available to be installed on site in a timely manner. Additional costs or substitutions necessitated because the Contractor failed to order material in a timely manner are not reimbursable. Costs associated with processing of paperwork by the Owner and design consultants resultant of such failures to coordinate the work by the Contractor shall have such costs reimbursed by the Contractor.

1.7 LOCATIONS:

A. General: Use equipment, materials and wiring methods suitable for the types of locations in which they are located.
   1. Dry Locations:
      a. All those indoor areas which do not fall within the definition below for Wet Locations and which are not otherwise designated on the Drawings.
   2. Wet Locations:
      a. All locations exposed to the weather or contact with water (such as kitchen areas subject to directional water spray as a means of cleaning surfaces), whether under a roof or not, unless otherwise designated on the Drawings.

1.8 SAFETY AND INDEMNITY:

A. Lock out Requirements:
   1. Provide disconnecting means capable of being locked out for machines and other equipment to prevent unexpected startup or release of stored energy in accordance with 29 CFR 1910.147

B. The Contractor is solely and completely responsible for conditions of the job site including safety of all persons and properly during performance of the work. This requirement will apply continually and not be limited to normal working hours.
   1. No act, service, drawing review or construction review by the Owner, the Engineer or their Consultants is intended to include reviews of the adequacy of the Contractors safety measures in or near the construction site.
   2. The Contractor performing work under this Division of the Specifications shall hold harmless, indemnify, and defend the Owner, the Engineer, their consultants, and each of their officers, agents and employees from any and all liability claims, losses, or damage arising out of or alleged to arise from bodily injury, sickness, or

death of a person or persons and for all damages arising out of injury to or destruction of property arising directly or indirectly out of or in connection with the performance of the work under this Division of the Specifications, and from the Contractor's negligence in the performance of the work described in the construction contract documents, but not including liability that may be due to the sole negligence of the Owner, the Engineer, their Consultants or their officers, agents and employees.

PART 2 PRODUCTS

2.1 STANDARD OF QUALITY:

A. Material and Equipment: Provide materials and equipment that are new and are current products of manufacturers regularly engaged in the production of such products. The standard products shall have been in satisfactory commercial or industrial use for two years prior to bid opening. The two-year period includes use of equipment and materials of similar size under similar circumstances. For uniformity, only one manufacturer will be accepted for each type of product.

B. Service Support: Submit a certified list of qualified permanent service organizations including their addresses and qualification for support of the equipment. These service organizations shall be convenient to the equipment installation and able to render service to the equipment on a regular and emergency basis during the warranty period of the contract.

C. Manufacturer's Recommendations: Where installation procedures are required to be in accordance with manufacturer's recommendations, furnish printed copies of the recommendations prior to installation. Installation of the item shall not proceed until recommendations are received. Failure to furnish recommendation shall be cause for rejection of the equipment or material.

2.2 FASTENERS:

A. Fasteners for securing equipment to walls, floors and the like shall be either hot-dip galvanized after fabrication or stainless steel.

2.3 FINISH REQUIREMENTS:

A. Equipment: Refer to each electrical equipment section of these Specifications for painting requirements of equipment enclosures. Repair any final paint finish which has been damaged or is otherwise unsatisfactory, to the satisfaction of the Engineer.

B. In finished areas, paint all exposed conduits, boxes and fittings to match the color of the surface to which they are affixed.

PART 3 EXECUTION

3.1 INSTALLATION:

A. Ensure that all equipment and materials fit properly in their installation.

B. Perform any required work to correct improperly fit installation at no additional expense to the Owner.

C. Equipment Installation:
   1. Provide the required inserts, bolts and anchors, and securely attach all equipment and materials to their supports.
   2. In all rooms with concrete floors, install all floor mounted equipment on reinforced concrete pads as shown. Insure that pads are seismically secured to the building structure. The Contractor, suppliers, and fabricators shall take this requirement into consideration when designing, fabricating, and installing panels and other enclosures so that height above the floor of the operating handles of electrical devices meets the requirements of these Specifications and applicable codes.
   3. Mount all metal panels which are mounted on or abutting concrete walls or any outside walls a minimum of ¼ inch from the wall, and paint the back sides of the panels with Bituminous Coating, Rust-oleum C9578 Coal Tar Epoxy Coating or approved equal. Film thickness shall be 10 mils minimum.

D. Cutting, Drilling and Welding:
   1. Provide the required cutting, drilling welding that is required for the electrical construction work. Comply with Division 1 requirements.
   2. Structural members shall not be cut or drilled, except after approval by the Engineer. Use a core drill wherever it is necessary to drill through concrete or masonry.
   3. Provide the required welding for equipment supports. Conduits and fittings shall not be welded to structural steel. Where welding is required, it shall be accomplished by tradesmen certified to do such work. Provide fire and other protection as appropriate.

3.2 FIELD TESTS:

A. Test shall be in accordance with Acceptance Testing specifications issued by the National Electrical Testing Association (NETA).

B. Perform equipment field tests and adjustments. Properly calibrate, adjust and operationally check all circuits and components, and demonstrate as ready for service. Perform each operational check three times to ensure the circuit and components are working properly. Make additional calibration and adjustments if it is determined later that the initial adjustments are not satisfactory for proper performance. Perform equipment field test for equipment where equipment field tests are specified in the equipment Specifications. Give sufficient notice to the Engineer prior to any test so that the tests may be witnessed.

C. Provide instruments, other equipment, temporary facilities as may be necessary, and material required for the tests. These shall be of the type designed for the type of tests

to be performed and shall be calibrated by a recognized testing laboratory within three months prior to testing.

D. Operational Tests: Operationally test all circuits to demonstrate that the circuits and equipment have been properly installed and adjusted and are ready for full-time service. Demonstrate the proper functioning of circuits in all modes of operation, including alarm conditions.

E. Re-testing will be required for all unsatisfactory tests after the equipment or system has been repaired. Re-test all related equipment and systems if required by the Engineer. Repair and re-test equipment and systems which have been satisfactorily tested but later fail, until satisfactory performance is obtained.

F. Perform calibration and adjustment on all equipment. Where the values for adjustment are not shown on the Drawings, obtain the proper values from the Engineer.

G. Maintain records of each test and submit five copies to the Engineer when testing is complete. All tests shall be witnessed by the Owner and/or Engineer at their discretion. These records shall include:
   1. Name of equipment tested.
   2. Date of report.
   3. Date of test.
   4. Description of test setup.
   5. Identification and rating of test equipment.
   6. Test results and data.
   7. Name of person performing test.
   8. Owner or Engineer's initials.

H. Items requiring testing as a minimum:
   1. Ground field grid.
   2. Circuit Breakers.

3.3 PAINTING OF EQUIPMENT:

A. Factory Applied: Electrical equipment shall have factory applied painting system which shall, as a minimum, meet the requirements of NEMA ICS 6 corrosion-resistance test and the additional requirements specified in the technical section.

B. Field Applied: Paint electrical equipment as required to match finish of adjacent surfaces or to meet the indicated or specified safety criteria.

3.4 RECORDS:

A. Maintain one copy of the contract Drawing Sheets on the site of the work for recording the record "as built" condition. After completion of the work, the Contractor shall neatly and carefully mark the work as actually constructed, revising, deleting and adding to the Drawing Sheets as required. The following requirements shall be complied with:

1. Drawings and associated as-built changes shall be completed in AutoCAD or Revit and submitted in CAD/Revit as well as PDF format. Documents with hand-written changes or with RFI responses and field sketches pasted on shall not be acceptable. Engineer shall make digital backgrounds of original contract documents available for Contractor's use upon request.
2. Cable Size and Type: Provide the size and type of each cable installed on the project.
3. Substructure: Where the location of duct lines, adjacent utilities, cable boxes, and manholes are found to different than shown, carefully mark the correct location on the Drawings. Work shall be dimensioned from existing improvements.
4. Record (As Built) Drawings: At the completion of the Work the Contractor shall provide a set of record "as built" drawings over to the Owner for his use.
   a. Record drawings are required to be transmitted within 30 days of beneficial occupancy.
   b. Transmittal and approval process:
      1) Contractor is to transmit one digital copy for review and comment.
      2) After acceptance of the above, the Contractor is to transmit three printed sets and one digital reproducible set.
      3) Contractor to provide information on their company in the margin of record drawings along with the date of the revisions and the associated revision number.

3.5 POSTED OPERATING INSTRUCTIONS:

A. Provide for each system and principal item of equipment as specified in the technical sections for use by operation and maintenance personnel. The operating instructions shall include the following:
   1. Single line diagrams, wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment at each major piece of distribution equipment.
   2. Start up, proper adjustments, operating, lubrication and shutdown procedures.
   3. Safety precautions.
   4. The procedure in the event of equipment failure.
   5. Other items of instruction as recommended by the manufacturer of each system or item of equipment.

B. Instruction to Owner's Personnel:
   1. Where specified in the technical sections, furnish the services of competent instructors to give full instruction to designated personnel in the adjustment, operation and maintenance of the specified systems and equipment, including pertinent safety requirements as required. Instructors shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or systems has been accepted and

turned over to the Owner for regular operation. The number of man-days (8 hours per day) of instruction furnished shall be as specified in the individual section. When more than 4 man-days of instruction are specified, use approximately half of the time for classroom instruction. Use other time for field instruction with equipment or system. When significant changes or modifications in the equipment or system are made under the terms of the contract, provide additional instructions to acquaint the operating personnel with the changes or modifications.

2. Contractor shall video record all training sessions and shall provide the Owner with a copy of the recording at the conclusion of the training. Recording shall be in digital video format (MP4, AVI, or similar) and shall be provided on USB stick or DVD labeled with the Contractor's contact information, the training topic, and date of training.
3. Contractor shall maintain an attendance sheet from each session which contains the following information:
   a. Attendees with associated arrival and departure time.
   b. Topics covered.
   c. Information provided.
   d. Signatures of attendees taken at the completion of the session.

3.6 CLEAN UP:

A. Thoroughly clean all soiled surfaces of installed equipment and materials, including, but not limited to, removal of all dirt, dust, debris, and unused construction materials.

B. Upon completion of electrical work, remove all surplus materials, rubbish, and debris that accumulated during the construction work. Leave the entire area neat, clean, and acceptable to the Engineer.

(1)

Substitution Request Form

Project Name: _____

Request Date: _____

Submittal Name: _____

Submittal Number: _____

Reason for Substitution Request (check all that apply):

	Reason	Additional Information
☐	Cost savings to the owner	*(Note cost savings here)*
☐	A product with features providing additional benefits to the end user	*(Note benefits here)*
☐	Improved finished environment, lay out of the final installation, or space savings over the specified equipment	*(Note benefits here)*
☐	Delivery considerations	*(Note schedule savings here)*
☐	Owner's specific requests	*(Note requested change and who made request here)*

(13) Product Data Information (provide one line per performance characteristic):

Property	Specified	Substitution	Meets	Exceeds
(e.g. Thermal Rating)	*(e.g. 90° C)*	*(e.g. 90° C)*	☒	☐
			☐	☐
			☐	☐
			☐	☐
			☐	☐
			☐	☐
			☐	☐
			☐	☐
			☐	☐
			☐	☐
			☐	☐
			☐	☐

(14)

END OF SECTION

SECTION 26 05 05
SELECTIVE DEMOLITION FOR ELECTRICAL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Electrical demolition.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work: As specified in individual sections.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that abandoned wiring and equipment serve only abandoned facilities.

B. Demolition drawings are based on casual field observation and existing record documents.

C. Report discrepancies to Architect before disturbing existing installation.

D. Beginning of demolition means installer accepts existing conditions.

3.2 PREPARATION

A. Disconnect electrical systems in walls, floors, and ceilings to be removed.

B. Coordinate utility service outages with utility company.

C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

D. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.
   1. Obtain permission from Owner at least 24 hours before partially or completely disabling system.
   2. Make temporary connections to maintain service in areas adjacent to work area.

E. Existing Fire Alarm System: Maintain existing system in service until new system is accepted. Disable system only to make switchovers and connections. Minimize outage duration.
   1. Notify Owner before partially or completely disabling system.
   2. Notify local fire service.
   3. Make notifications at least 24 hours in advance.
   4. Make temporary connections to maintain service in areas adjacent to work area.

F. Existing Telephone System: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.
   1. Notify Owner at least 24 hours before partially or completely disabling system.
   2. Notify telephone utility company at least 24 hours before partially or completely disabling system.
   3. Make temporary connections to maintain service in areas adjacent to work area.

3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Perform work for removal and disposal of equipment and materials containing toxic substances regulated under the Federal Toxic Substances Control Act (TSCA) in accordance with applicable federal, state, and local regulations. Applicable equipment and materials include, but are not limited to:
   1. PCB-containing electrical equipment, including transformers, capacitors, and switches.
   2. PCB- and DEHP-containing lighting ballasts.
   3. Mercury-containing lamps and tubes, including fluorescent lamps, high intensity discharge (HID), arc lamps, ultra-violet, high pressure sodium, mercury vapor, ignitron tubes, neon, and incandescent.

B. Remove, relocate, and extend existing installations to accommodate new construction.

C. Remove abandoned wiring to source of supply.

D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.

E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.

F. Disconnect and remove abandoned panelboards and distribution equipment.

G. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.

H. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.

I. Repair adjacent construction and finishes damaged during demolition and extension work.

J. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.

K. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

3.4 CLEANING AND REPAIR

A. See Section 01 74 19 - Construction Waste Management and Disposal for additional requirements.

B. Clean and repair existing materials and equipment that remain or that are to be reused.

C. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

D. Luminaires: Remove existing luminaires for cleaning. Use mild detergent to clean all exterior and interior surfaces; rinse with clean water and wipe dry. Replace lamps, ballasts and broken electrical parts.

END OF SECTION

SECTION 26 0526
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Grounding and bonding requirements.

B. Conductors for grounding and bonding.

C. Connectors for grounding and bonding.

1.2 RELATED REQUIREMENTS

A. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

1.3 REFERENCE STANDARDS

A. IEEE 81 - IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System; 2012.

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

C. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems; 2021.

D. CEC – California Electrical Code; 2022 Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

E. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Verify exact locations of underground metal water service pipe entrances to building.
2. Coordinate the work with other trades to provide steel reinforcement complying with specified requirements for concrete-encased electrode.
3. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.5 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets for grounding and bonding system components.

B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

C. Field quality control test reports.

D. Project Record Documents: Record actual locations of grounding electrode system components and connections.

1.6 QUALITY ASSURANCE

A. Comply with requirements of CEC.

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

C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 GROUNDING AND BONDING REQUIREMENTS

A. Existing Work: Where existing grounding and bonding system components are indicated to be reused, they may be reused only where they are free from corrosion, integrity and continuity are verified, and where acceptable to the authority having jurisdiction.

B. Do not use products for applications other than as permitted by CEC and product listing.

C. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.

D. Where conductor size is not indicated, size to comply with CEC but not less than applicable minimum size requirements specified.

E. Grounding System Resistance:
   1. Achieve specified grounding system resistance under normally dry conditions unless otherwise approved by Architect. Precipitation within the previous 48 hours does not constitute normally dry conditions.
   2. Grounding Electrode System: Not greater than 5 ohms to ground, when tested according to IEEE 81 using "fall-of-potential" method.
   3. Between Grounding Electrode System and Major Electrical Equipment Frames, System Neutral, and Derived Neutral Points: Not greater than 0.5 ohms, when tested using "point-to-point" methods.

F. Bonding and Equipment Grounding:
   1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding

terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with CEC.

2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with CEC.
4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.
7. Provide bonding for interior metal piping systems in accordance with CEC. This includes, but is not limited to:
   a. Metal water piping where not already effectively bonded to metal underground water pipe used as grounding electrode.
   b. Metal gas piping.
8. Provide bonding for metal building frame.

G. Communications Systems Grounding and Bonding:
1. Provide intersystem bonding termination at service equipment or metering equipment enclosure and at disconnecting means for any additional buildings or structures in accordance with CEC.
2. Provide bonding jumper in raceway from intersystem bonding termination to each communications room or backboard and provide ground bar for termination.
   a. Bonding Jumper Size: 6 AWG, unless otherwise indicated or required.
   b. Ground Bar Size: 1/4 by 2 by 12 inches unless otherwise indicated or required.
   c. Ground Bar Mounting Height: 18 inches above finished floor unless otherwise indicated.

2.2 GROUNDING AND BONDING COMPONENTS

A. General Requirements:
1. Provide products listed, classified, and labeled as suitable for the purpose intended.
2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 05 26:
1. Use insulated copper conductors unless otherwise indicated.
   a. Exceptions:

1) Use bare copper conductors where installed underground in direct contact with earth.
2) Use bare copper conductors where directly encased in concrete (not in raceway).

C. Connectors for Grounding and Bonding:
1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
3. Unless otherwise indicated, use exothermic welded connections for accessible connections.
4. Manufacturers - Exothermic Welded Connections:

D. Ground Bars:
1. Description: Copper rectangular ground bars with mounting brackets and insulators.
2. Size: As indicated.
3. Holes for Connections: As indicated or as required for connections to be made.
4. Manufacturers:

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that work likely to damage grounding and bonding system components has been completed.

B. Verify that field measurements are as indicated.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

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

B. Perform work in accordance with NECA 1 (general workmanship).

C. Make grounding and bonding connections using specified connectors.
1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.

5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

D. Identify grounding and bonding system components in accordance with Section 26 05 53.

3.3 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS except Section 4.

B. Perform inspections and tests listed in NETA ATS, Section 7.13.

C. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.

D. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.

E. Submit detailed reports indicating inspection and testing results and corrective actions taken.

END OF SECTION

SECTION 26 05 33.13
CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Galvanized steel rigid metal conduit (RMC).
B. Flexible metal conduit (FMC).
C. Liquidtight flexible metal conduit (LFMC).
D. Galvanized steel electrical metallic tubing (EMT).
E. Rigid polyvinyl chloride (PVC) conduit.
F. High-density polyethylene (HDPE) conduit.

1.2 RELATED REQUIREMENTS

A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
   1. Includes additional requirements for fittings for grounding and bonding.
B. Section 26 05 33.16 - Boxes for Electrical Systems.
C. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

1.3 REFERENCE STANDARDS

A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2020.
B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S); 2020.
C. ANSI C80.6 - American National Standard for Electrical Intermediate Metal Conduit; 2018.
D. ASTM D1002 - Standard Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal); 2010 (Reapproved 2019).
E. ASTM D1598 - Standard Test Methods for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure; 2021.
F. ASTM D1599 - Standard Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings; 2018.

G. ASTM D2683 - Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing; 2020.

H. ASTM D3261 - Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing; 2016.

I. ASTM F1055 - Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene and Crosslinked Polyethylene (PEX) Pipe and Tubing; 2016a (Reapproved 2022).

J. ASTM F2160 - Standard Specification for Solid Wall High Density Polyethylene (HDPE) Conduit Based on Controlled Outside Diameter (OD); 2016.

K. ASTM F2176 - Standard Specification for Mechanical Couplings Used on Polyethylene Conduit, Duct and Innerduct; 2017.

L. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

M. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); 2020.

N. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); 2017.

O. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.

P. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; 2020.

Q. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; 2021.

R. NEMA TC 7 - Solid-Wall Coilable and Straight Electrical Polyethylene Conduit; 2021.

S. CEC - California Electrical Code; 2022 Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

T. UL 1 - Flexible Metal Conduit; Current Edition, Including All Revisions.

U. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.

V. UL 360 - Liquid-Tight Flexible Metal Conduit; Current Edition, Including All Revisions.

W. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.

X. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.

Y. UL 651A - Schedule 40 and 80 High Density Polyethylene (HDPE) Conduit; Current Edition, Including All Revisions.

Z. UL 746C - Polymeric Materials – Use in Electrical Equipment Evaluations; Current Edition, Including All Revisions.

AA. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.

BB. UL 1203 - Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations; Current Edition, Including All Revisions.

CC. UL 1242 - Electrical Intermediate Metal Conduit-Steel; Current Edition, Including All Revisions.

DD. UL 2419 - Outline of Investigation for Electrically Conductive Corrosion Resistant Compounds; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
1. Coordinate minimum sizes of conduits with actual type and quantity of conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
2. Coordinate arrangement of conduits with structural members, ductwork, piping, equipment, and other potential conflicts.
3. Verify exact conduit termination locations required for boxes, enclosures, and equipment.
4. Coordinate work to provide roof penetrations that preserve integrity of roofing system and do not void roof warranty.
5. Notify Architect of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Sequencing:
1. Do not begin installation of conductors and cables until installation of conduit between termination points is complete.

1.5 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.

B. Project Record Documents: Record actual routing for conduits installed underground, conduits embedded within concrete slabs, and conduits 2-inch (53 mm) trade size and larger.

1.6 QUALITY ASSURANCE

A. Product Listing Organization Qualifications: Organization recognized by OSHA as Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 CONDUIT APPLICATIONS

A. Do not use conduit and associated fittings for applications other than as permitted by CEC, manufacturer's instructions, and product listing.

B. Unless otherwise indicated and where not otherwise restricted, use conduit types indicated for specified applications. Where more than one listed application applies, comply with most restrictive requirements. Where conduit type for particular application is not specified, use galvanized steel rigid metal conduit.

C. Underground:
   1. Under Slab on Grade: Use rigid PVC conduit.
   2. Exterior, Direct-Buried: Use rigid PVC conduit or HDPE.
   3. Exterior, Embedded Within Concrete: Use rigid PVC conduit.
   4. Where rigid polyvinyl chloride (PVC) conduit or high-density polyethylene (HDPE) conduit is provided, transition to galvanized steel rigid metal conduit (RMC) where emerging from underground.
   5. Where rigid polyvinyl (PVC) conduit larger than 2-inch (53 mm) trade size is provided, use galvanized steel rigid metal conduit (RMC) elbows for bends.
   6. Where galvanized steel rigid metal conduit (RMC) or galvanized steel intermediate metal conduit (IMC) is installed in direct contact with earth, use corrosion protection tape, factory-applied corrosion protection coating, or field-applied corrosion protection compound acceptable to authorities having jurisdiction to provide supplementary corrosion protection.
   7. Where steel conduit emerges from concrete into soil, use corrosion protection tape to provide supplementary corrosion protection for a minimum of 4 inches on either side of where conduit emerges.

D. Embedded Within Concrete:
   1. Within Slab on Grade (within structural slabs only where approved by Structural Engineer): Use rigid PVC conduit.
   2. Within Slab Above Ground (within structural slabs only where approved by Structural Engineer): Use rigid PVC conduit.
   3. Within Concrete Walls Above Ground: Use rigid PVC conduit.
   4. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit (RMC) where emerging from concrete.
   5. Where galvanized steel electrical metallic tubing (EMT) or galvanized steel rigid metal conduit (RMC) emerges from concrete into salt air, use corrosion protection tape, factory-applied corrosion protection coating, or field-applied corrosion protection compound acceptable to authorities having jurisdiction to provide supplementary corrosion protection for minimum of 4 inches on either side of where conduit emerges.

E. Concealed Within Hollow Masonry Walls: Use galvanized steel rigid metal conduit or electrical metallic tubing (EMT).

F. Concealed Within Hollow Stud Walls: Use electrical metallic tubing (EMT).

G. Concealed Above Accessible Ceilings: Use electrical metallic tubing (EMT).

H. Interior, Damp or Wet Locations: Use galvanized steel rigid metal conduit (RMC).

I. Exposed, Interior, Not Subject to Physical Damage: Use electrical metallic tubing (EMT).

J. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit.
   1. Locations subject to physical damage include, but are not limited to:
      a. Where exposed below 8 feet, except within electrical and communication rooms or closets.
      b. Where exposed below 20 feet in warehouse areas.

K. Exposed, Exterior: Use galvanized steel rigid metal conduit.

L. Concealed, Exterior, Not Embedded in Concrete or in Contact With Earth: Use galvanized steel rigid metal conduit or electrical metallic tubing (EMT).

M. Flexible Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit (FMC).
   1. Maximum Length: 6 feet.

N. Flexible Connections to Vibrating Equipment:
   1. Dry Locations: Use flexible metal conduit (FMC).
   2. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit (LFMC).
   3. Maximum Length: 6 feet unless otherwise indicated.
   4. Vibrating equipment includes, but is not limited to:
      a. Transformers.
      b. Motors.

2.2 CONDUIT - GENERAL REQUIREMENTS

A. Comply with CEC.

B. Fittings for Grounding and Bonding: See Section 26 05 26 for additional requirements.

C. Provide conduit, fittings, supports, and accessories required for complete raceway system.

D. Provide products listed, classified, and labeled as suitable for purpose intended.

E. Minimum Conduit Size, Unless Otherwise Indicated:
   1. Branch Circuits: 3/4 inch (21 mm) trade size.
   2. Underground, Interior: 1 inch (27 mm) trade size.
   3. Underground, Exterior: 1-inch trade size.

F. Where conduit size is not indicated, size to comply with CEC but not less than applicable minimum size requirements specified.

2.3 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Manufacturers:
   1. Allied Tube & Conduit, a division of Atkore International: www.alliedeg.com/#sle.
   2. Western Tube, a division of Zekelman Industries: www.westerntube.com/#sle.
   3. Wheatland Tube, a division of Zekelman Industries: www.wheatland.com/#sle.

B. Conduit with integral fittings, such as Allied Tube and Conduit's "Kwik-Couple" are not permitted.

C. Interior conduits shall be color-coded based on the wiring or system type they serve. Paint shall be factory applied by the manufacturer
   1. Normal Power Systems: No color
   2. Emergency and Standby Power Systems: Yellow
   3. Fire Alarm: Red
   4. Security: Orange
   5. Telephone and Data: Refer to Division 27
   6. Audio/Visual: Refer to Division 27
   7. Other Low Voltage: Refer to Division 27

D. Description: CEC, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.

E. Fittings:
   1. Manufacturers:
      a. ABB; T&B: www.electrification.us.abb.com/#sle.
      b. Allied Tube & Conduit, a division of Atkore International: www.alliedeg.us/#sle.
      c. Emerson Electric Co; O-Z/Gedney: www.emerson.com/#sle.
   2. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 6.
   3. Hazardous/Classified Locations: Use fittings listed and labeled as complying with UL 1203 for classification of installed location.
   4. Material: Use steel or malleable iron.
      a. Do not use die cast zinc fittings.
   5. Connectors and Couplings: Use threaded type fittings only. Threadless fittings, including set screw and compression/gland types, are not permitted.

2.4 FLEXIBLE METAL CONDUIT (FMC)

A. Manufacturers:
   1. AFC Cable Systems, a division of Atkore International: www.afcweb.com/#sle.

B. Description: CEC, Type FMC standard-wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems.

C. Fittings:
   1. Manufacturers:
      a. ABB; T&B: www.electrification.us.abb.com/#sle.
      b. Emerson Electric Co; O-Z/Gedney: www.emerson.com/#sle.
   2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   3. Material: Use steel or malleable iron.

a. Do not use die cast zincfittings.

2.5 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

A. Manufacturers:
1. AFC Cable Systems, a division of Atkore International: www.afcweb.com/#sle.

B. Description: CEC, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.

C. Fittings:
1. Manufacturers:
a. ABB; T&B: www.electrification.us.abb.com/#sle.
b. Emerson Electric Co; O-Z/Gedney: www.emerson.com/#sle.
2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
3. Material: Use steel or malleableiron.
a. Do not use die cast zincfittings.

2.6 GALVANIZED STEEL ELECTRICAL METALLIC TUBING (EMT)

A. Manufacturers:
1. Allied Tube & Conduit, a division of Atkore International: www.alliedeg.com/#sle.
2. Western Tube, a division of Zekelman Industries: www.westerntube.com/#sle.
3. Wheatland Tube, a division of Zekelman Industries: www.wheatland.com/#sle.

B. Description: CEC, Type EMT galvanized steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

C. Conduits with integral fittings similar to Allied Tube & Conduit's "Kwik-Fit" shall not be used.

D. Interior conduits shall be color-coded based on the wiring or system type they serve. Paint shall be factory applied by the manufacturer
1. Normal Power Systems: No color
2. Emergency and Standby Power Systems: Yellow
3. Fire Alarm: Red
4. Security: Orange
5. Telephone and Data: Refer to Division 27
6. Audio/Visual: Refer to Division 27
7. Other Low Voltage: Refer to Division 27

E. Fittings:
1. Manufacturers:
a. ABB; T&B: www.electrification.us.abb.com/#sle.
b. Allied Tube & Conduit, a division of Atkore International: www.alliedeg.us/#sle.
c. Emerson Electric Co; O-Z/Gedney: www.emerson.com/#sle.

2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
3. Material: Use steel or malleable iron.
   a. Do not use die cast zinc fittings.
4. Connectors and Couplings: Use compression/gland or set-screw type.
   a. Do not use indenter type connectors and couplings.

2.7 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

A. Manufacturers:
   1. ABB; Carlon: www.carlon.com/#sle.
   2. Allied Tube & Conduit, a division of Atkore International: www.alliedeg.com/#sle.
   3. Cantex Inc: www.cantexinc.com/#sle.

B. Description: CEC, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.

C. Fittings:
   1. Expansion fittings similar to Carlon's "E945" series shall not be used.
   2. Manufacturer: Same as manufacturer of conduit to be connected.
   3. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

2.8 HIGH-DENSITY POLYETHYLENE (HDPE) CONDUIT

A. Manufacturers:
   1. ABB; Carlon: www.electrification.us.abb.com/#sle.
   2. Blue Diamond Industries, LLC: www.bdiky.com/#sle.
   3. Eastern Wire + Conduit, a division of Atkore International: www.easternwire.com/#sle.

B. Description: CEC, Type HDPE high-density polyethylene solid-wall conduit complying with ASTM F2160 and NEMA TC 7; list and label as complying with UL 651A; Schedule 40 unless otherwise indicated.

C. Joining Methods: Approved by HDPE conduit manufacturer.

D. Mechanical Fittings: Comply with ASTM F2176; list and label as complying with UL 651A.

E. Butt Heat Fusion Fittings: Comply with ASTM D3261.

F. Socket Fusion Fittings: Comply with ASTM D2683.

G. Electrofusion Fittings: Comply with ASTM F1055.

2.9 ACCESSORIES

A. Corrosion Protection Tape: PVC-based, minimum thickness of 20 mil, 0.020 inch.

B. Conduit Joint Compound: Corrosion-resistant, electrically conductive compound listed as complying with UL 2419; suitable for use with conduit to be installed.

C. Solvent Cement for PVC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.

D. Adhesive for HDPE Conduit:
   1. Specifically designed for bonding dissimilar materials in lieu of transition fittings, including but not limited to polyethylene, fiberglass, PVC, aluminum, and steel; UL 746C recognized.
   2. Approved by adhesive manufacturer for use with materials to be joined.
   3. Adhesive Shear Strength: Not less that 100 psi, when tested in accordance with ASTM D1002.
   4. Hydrostatic Pressure Resistance: No leaks, when tested in accordance with ASTM D1598 at 120 psi for 1,000 hours and when tested in accordance with ASTM D1599 at 250 psi.
   5. Products:
      a. American Polywater Corporation; Polywater BonDuit Conduit Adhesive: www.polywater.com/#sle.

E. Pull Strings: Use nylon or polyester tape with average breaking strength of not less than 1,250 lbf.

F. Foam Conduit Sealant:
   1. Removable, two-part, closed-cell foam, specifically designed for sealing conduit openings against water, moisture, gases, and dust.
   2. Suitable for use with conductors/cables and associated insulation/jackets to be installed.
   3. Rated to hold minimum of 10 ft water head pressure.
   4. Products:
      a. American Polywater Corporation; Polywater AFT Foam Duct Sealant: www.polywater.com/#sle.
      b. American Polywater Corporation; Polywater FST Foam Duct Sealant: www.polywater.com/#sle.

G. Conduit Mechanical Seals:
   1. Listed as complying with UL 514B.
   2. Specifically designed for sealing conduit openings against water, moisture, gases, and dust.
   3. Suitable for sealing around conductors/cables to be installed.
   4. Products:
      a. American Polywater Corporation; PHRD SG Mechanical Seals: www.polywater-haufftechnik.com/#sle.

H. Sealing Compound for Hazardous/Classified Location Sealing Fittings: Listed for use with particular fittings to be installed.

I. Sealing Systems for Concrete Penetrations:
   1. Sleeves: Provide water stop ring or cement coating that bonds to concrete to prevent water infiltration.
   2. Rate for minimum of 40 psig; suitable for sealing around conduits to be installed.
   3. Products:
      a. American Polywater Corporation; PZVR Cement-Coated Concrete Wall Sleeves: www.polywater-haufftechnik.com/#sle.
      b. American Polywater Corporation; PHSD Mechanical Seals: www.polywater-haufftechnik.com/#sle.
      c. American Polywater Corporation; PHSI 150 Varia Double Wall Inserts: www.polywater-haufftechnik.com/#sle.
      d. American Polywater Corporation; PGKD Modular Seals: www.polywater-haufftechnik.com/#sle.

J. Sealing Systems for Roof Penetrations: Premanufactured components and accessories as required to preserve integrity of roofing system and maintain roof warranty; suitable for conduits and roofing system to be installed; designed to accommodate existing penetrations where applicable.
   1. Products:
      a. Alta Products, LLC; Sigrist Pipe Chase Housing, Curbs, and Exit Seals: www.altaproductsllc.com/#sle.
      b. Menzies Metal Products; Electrical Roof Stack and Cap: www.menzies-metal.com/#sle.
      c. Menzies Metal Products; Electrical Retro Box: www.menzies-metal.com/#sle.

K. Flashing Panels for Exterior Wall Penetrations: Premanufactured components and accessories as required to preserve integrity of building envelope; suitable for conduits and facade materials to be installed.
   1. Products:
      a. Quickflash Weatherproofing Products, Inc: www.quickflashproducts.com/#sle.

L. Duct Bank Spacers: Nonmetallic; designed for maintaining conduit/duct spacing for concrete encasement in open trench installation; suitable for conduit/duct arrangement to be installed.
   1. Products:
      a. Advance Products & Systems, LLC; Duct Bank Spacers: www.apsonline.com/#sle

M. Firestop Sleeves: Listed; provide as required to preserve fire resistance rating of building elements.
   1. Products:
      a. HoldRite, a brand of Reliance Worldwide Corporation; HydroFlame Pro Series/HydroFlame Custom Built: www.holdrite.com/#sle.

N. Bore Spacers: Nonmetallic; designed for maintaining conduit/duct spacing for installation within casing; furnished with roller wheels to facilitate installation, openings to facilitate grout flow, and holes for stabilization cable; suitable for casing and conduit/duct arrangement to be installed.
   1. Products:
      a. Advance Products & Systems, LLC; Bore Spacers: www.apsonline.com/#sle.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that mounting surfaces are ready to receive conduits.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

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

B. Install conduit in accordance with NECA 1.

C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.

D. Install intermediate metal conduit (IMC) in accordance with NECA 101.

E. Install rigid polyvinyl chloride (PVC) conduit in accordance with NECA 111.

F. Conduit Routing:
   1. Unless dimensioned, conduit routing indicated is diagrammatic.
   2. When conduit destination is indicated without specific routing, determine exact routing required.
   3. Conceal conduits unless specifically indicated to be exposed.
   4. Conduits in the following areas may be exposed, unless otherwise indicated:
      a. Electrical rooms.
      b. Mechanical equipment rooms.
      c. Within joists in areas with no ceiling.
   5. Unless otherwise approved, do not route exposed conduits:
      a. Across floors.
      b. Across top of parapet walls.
      c. Across building exterior surfaces.
   6. Conduits installed underground or embedded in concrete may be routed in shortest possible manner unless otherwise indicated. Route other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.
   7. Arrange conduit to maintain adequate headroom, clearances, and access.
   8. For power conduits, arrange conduit to provide no more than the equivalent of three 90 degree bends between pull points.

9. For low voltage conduits, arrange conduit to provide no more than the equivalent of two 90 degree bends between pull points.
10. Arrange conduit to provide no more than 150 feet between pull points.
11. Route conduits above water and drain piping where possible.
12. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.
13. Maintain minimum clearance of 6 inches between conduits and piping for other systems.
14. Maintain minimum clearance of 12 inches between conduits and hot surfaces. This includes, but is not limited to:
    a. Heaters.
    b. Hot water piping.
    c. Flues.
15. Group parallel conduits in same area on common rack.

G. Conduit Support:
1. Secure and support conduits in accordance with CEC using suitable supports and methods approved by authorities having jurisdiction
2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
4. Use conduit strap to support single surface-mounted conduit.
    a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
5. Use metal channel/strut with accessory conduit clamps to support multiple parallel surface-mounted conduits.
6. Use conduit clamp to support single conduit from beam clamp or threaded rod.
7. Use trapeze hangers assembled from threaded rods and metal channel/strut with accessory conduit clamps to support multiple parallel suspended conduits.
8. Use nonpenetrating rooftop supports to support conduits routed across rooftops, where approved.
9. Use of spring steel conduit clips for support of conduits is not permitted.
10. Use of wire for support of conduits is not permitted.
11. Where conduit support intervals specified in CEC and NECA standards differ, comply with most stringent requirements.

H. Connections and Terminations:
1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.

3. Use suitable adapters where required to transition from one type of conduit to another.
4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.
5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
6. Provide insulating bushings, insulated throats, or listed metal fittings with smooth, rounded edges at conduit terminations to protect conductors.
7. Secure joints and connections to provide mechanical strength and electrical continuity.

I. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
2. Make penetrations perpendicular to surfaces unless otherwise indicated.
3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
4. Conceal bends for conduit risers emerging above ground.
5. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
6. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty.
7. Provide metal escutcheon plates for conduit penetrations exposed to public view.
8. Install firestopping to preserve fire resistance rating of partitions and other elements.

J. Conduit Sealing:
1. Use foam conduit sealant to prevent entry of moisture and gases. This includes, but is not limited to:
   a. Where conduits enter building from outside.
   b. Where service conduits enter building from underground distribution system.
   c. Where conduits enter building from underground.
   d. Where conduits may transport moisture to contact live parts.
2. Where conduits cross barriers between areas of potential substantial temperature differential, use foam conduit sealant at accessible point near penetration to prevent condensation. This includes, but is not limited to:
   a. Where conduits pass from outdoors into conditioned interior spaces.
   b. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.
   c. Where conduits penetrate coolers or freezers.
3. Where conduits cross boundaries of hazardous/classified locations, provide identified/listed sealing fittings or conduit mechanical seals as approved by authorities having jurisdiction; locate as indicated or in accordance with CEC.

K. Provide pull string in each empty conduit and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12 inches at each end.

L. Provide grounding and bonding; see Section 26 05 26.

M. Identify conduits; see Section 26 05 53.

3.3 FIELD QUALITY CONTROL

A. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

B. Correct deficiencies and replace damaged or defective conduits.

3.4 CLEANING

A. Clean interior of conduits to remove moisture and foreign matter.

3.5 PROTECTION

A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION

SECTION 26 05 33.16
BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Outlet and device boxes up to 100 cubic inches, including those used as junction and pull boxes.

B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches.

C. Floor boxes.

D. Underground boxes/enclosures.

E. Accessories.

1.2 RELATED REQUIREMENTS

A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.

B. Section 26 05 33.13 - Conduit for Electrical Systems:
   1. Conduit bodies and other fittings.
   2. Additional requirements for locating boxes to limit conduit length and/or number of bends between pulling points.

C. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

1.3 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.

C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.

D. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.

E. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; 2013 (Reaffirmed 2020).

F. CEC - California Electrical Code; 2022 Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. SCTE 77 - Specifications for Underground Enclosure Integrity; 2017.

H. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

I. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

J. UL 508A - Industrial Control Panels; Current Edition, Including All Revisions.

K. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by CEC.
   2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to CEC.
   4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to CEC.
   5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
   6. Coordinate the work with other trades to preserve insulation integrity.
   7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
   8. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.5 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets for cabinets and enclosures, floor boxes, and underground boxes/enclosures.
   1. Underground Boxes/Enclosures: Include reports for load testing in accordance with SCTE 77 certified by a professional engineer or an independent testing agency upon request.

B. Project Record Documents: Record actual locations for outlet and device boxes, pull boxes, cabinets and enclosures, floor boxes, and underground boxes/enclosures.

C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Keys for Lockable Enclosures: Two of each different key.

1.6 QUALITY ASSURANCE

A. Comply with requirements of CEC.

B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 BOXES

A. General Requirements:
1. Do not use boxes and associated accessories for applications other than as permitted by CEC and product listing.
2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
3. Provide products listed, classified, and labeled as suitable for the purpose intended.
4. Where box size is not indicated, size to comply with CEC but not less than applicable minimum size requirements specified.
5. Provide grounding terminals within boxes where equipment grounding conductors terminate.

B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:
1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
3. Use cast iron boxes or cast aluminum boxes where exposed galvanized steel rigid metal conduit is used.
4. Use suitable concrete type boxes where flush-mounted in concrete.
5. Use suitable masonry type boxes where flush-mounted in masonry walls.
6. Use raised covers suitable for the type of wall construction and device configuration where required.
7. Use shallow boxes where required by the type of wall construction.
8. Do not use "through-wall" boxes designed for access from both sides of wall.
9. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
10. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
11. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.

12. Gangable or sectional boxes shall not be permitted.
13. Minimum Box Size, Unless Otherwise Indicated:
    a. Wiring Devices (Other Than Communications Systems Outlets): 4 inch square by 1-1/2 inch deep (100 by 38 mm) trade size.
    b. Communications Systems Outlets: 4 inch square by 2-1/8 inch (100 by 54 mm) trade size.
    c. Ceiling Outlets: 4 inch octagonal or square by 1-1/2 inch deep (100 by 38 mm) trade size.
14. Wall Plates: Comply with Section 26 27 26.
15. Manufacturers:
    a. Hubbell Incorporated; RACO Products: www.hubbell-rtb.com/#sle.
    b. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com/#sle.
    c. Thomas & Betts Corporation: www.tnb.com/#sle.

C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
2. NEMA 250 Environment Type, Unless Otherwise Indicated:
    a. Indoor Clean, Dry Locations: Type 1, painted steel.
    b. Outdoor Locations: Type 3R, painted steel.
3. Junction and Pull Boxes Larger Than 100 cubic inches:
    a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.
4. Cabinets and Hinged-Cover Enclosures, Other Than Junction and Pull Boxes:
    a. Provide lockable hinged covers, all locks keyed alike unless otherwise indicated.
5. Finish for Painted Steel Enclosures: Manufacturer's standard grey unless otherwise indicated.
6. Manufacturers:
    a. Cooper B-Line, a division of Eaton Corporation: www.cooperindustries.com/#sle.
    b. Hoffman, a brand of Pentair Technical Products: www.hoffmanonline.com/#sle.
    c. Hubbell Incorporated; Wiegmann Products: www.hubbell-wiegmann.com/#sle.

D. Underground Boxes/Enclosures:
1. Description: In-ground, open bottom boxes furnished with flush, non-skid covers with legend indicating type of service and stainless steel tamper resistant cover bolts.
2. Size: As indicated on drawings.

3. Depth: As required to extend below frost line to prevent frost upheaval, but not less than 12 inches.
4. Provide logo on cover to indicate type of service. Covers shall read as follows for each system type:
   a. Power Systems: "ELECTRICAL"
   b. Site Lighting and/or Pole Lighting: "LIGHTING"
   c. Fire Alarm Systems: "FIRE ALARM"
   d. Other Low Voltage Systems: "COMMUNICATIONS"
5. Applications:
   a. Sidewalks/paved areas 6'-0" wide and smaller and Landscaped Areas Subject Only to Occasional Nondeliberate Vehicular Traffic: Use polymer concrete enclosures, with minimum SCTE 77 Tier 8 load rating.
   b. Parking Lots, Sidewalks/paved areas larger than 6'-0" wide, and in Areas Subject Only To Occasional Vehicular Traffic: Use reinforced concrete enclosures with galvanzed steel checker plate lids, with HS20-44 rating.
   c. Do not use polymer concrete enclosures in areas subject to deliberate vehicular traffic.
6. Polymer Concrete and Reinforced Concrete Underground Boxes/Enclosures: Comply with SCTE 77 and HS20-44.
   a. Manufacturers:
      1) Oldcastle Precast, Inc: www.oldcastleprecast.com/#sle.
   b. Combination fiberglass/polymer concrete boxes/enclosures are not acceptable. Use all-polymer concrete boxes/enclosures.

2.2 ACCESSORIES

A. Flashing Panels for Exterior Wall Penetrations: Premanufactured components and accessories as required to preserve integrity of building envelope; suitable for boxes and facade materials to be installed.
   1. Manufacturers:
      a. Quickflash Weatherproofing Products, Inc: www.quickflashproducts.com/#sle.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that mounting surfaces are ready to receive boxes.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

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

B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and CEC.

D. Provide separate boxes for emergency power and normal power systems.

E. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.

F. Flush-mount boxes in finished areas unless specifically indicated to be surface-mounted.

G. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.

H. Box Locations:
   1. Locate boxes to be accessible. Provide access panels in accordance with Section 08 31 00 as required where approved by the Architect.
   2. Unless dimensioned, box locations indicated are approximate.
   3. Locate boxes so that wall plates do not span different building finishes.
   4. Locate boxes so that wall plates do not cross masonry joints.
   5. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
   6. Do not install flush-mounted boxes on opposite sides of walls back-to-back. Provide minimum 6 inches horizontal separation unless otherwise indicated.
   7. Acoustic-Rated Walls: Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches horizontal separation.
   8. Fire Resistance Rated Walls: Install flush-mounted boxes such that the required fire resistance will not be reduced.
      a. Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches separation where wall is constructed with individual noncommunicating stud cavities or protect both boxes with listed putty pads.
      b. Do not install flush-mounted boxes with area larger than 16 square inches or such that the total aggregate area of openings exceeds 100 square inches for any 100 square feet of wall area.
   9. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points in accordance with Section 26 05 33.13.
   10. Outlet boxes shall be installed at the locations and elevations shown on the drawings or specified herein. Make adjustments to locations as required by structural conditions and to suit coordination requirements of other trades.
   11. Locate switch outlet boxes on the latch side of doorways unless otherwise indicated.
   12. Locate junction and pull boxes in the following areas, unless otherwise indicated or approved by the Architect:

13. Outlet boxes shall not be installed back to back nor shall through-wall boxes be permitted.
14. For boxes mounted in exterior walls, make sure that there is insulation behind outlet boxes to prevent condensation in boxes.
15. For outlets mounted above counters, benches or backsplashes, coordinate location and mounting heights with built-in units. Adjust mounting height with required location for equipment served.
    a. Concealed above accessible suspended ceilings.
    b. Within joists in areas with no ceiling.
    c. Electrical rooms.
    d. Mechanical equipment rooms.

I. Box Supports:
1. Secure and support boxes in accordance with CEC and Section 26 05 29 using suitable supports and methods approved by the authority having jurisdiction.
2. Provide required seismic controls in accordance with Section 26 05 48.
3. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with CEC. Do not provide support from piping, ductwork, or other systems.
4. Installation Above Suspended Ceilings: Do not provide support from ceiling grid or ceiling support system.
5. Use far-side support to secure flush-mounted boxes supported from single stud in hollow stud walls. Repair or replace supports for boxes that permit excessive movement.

J. Install boxes plumb and level.

K. Flush-Mounted Boxes:
1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch or does not project beyond finished surface.
2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch at the edge of the box.

L. Install boxes as required to preserve insulation integrity.

M. Underground Boxes/Enclosures:
1. Install enclosure on gravel base, minimum 6 inches deep.
2. Flush-mount enclosures located in concrete or paved areas.
3. Mount enclosures located in landscaped areas with top at 1 inch above finished grade.

4. Install additional bracing inside enclosures in accordance with manufacturer's instructions to minimize box sidewall deflections during backfilling. Backfill with cover bolted in place.

N. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

O. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.

P. Close unused box openings.

Q. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use. Leave no unused openings in any box. Install close-up plugs as required to seal all openings and removed knockouts.

R. Provide grounding and bonding in accordance with Section 26 05 26.

S. Identify boxes in accordance with Section 26 05 53.

3.3 CLEANING

A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

3.4 PROTECTION

A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

END OF SECTION

SECTION 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Electrical identification requirements.

B. Identification nameplates and labels.

C. Wire and cable markers.

D. Voltage markers.

E. Underground warning tape.

F. Floor marking tape.

G. Warning signs and labels.

1.2 RELATED REQUIREMENTS

A. Section 27 10 00 - Structured Cabling: Identification for communications cabling and devices.

1.3 REFERENCE STANDARDS

A. ANSI Z535.2 - American National Standard for Environmental and Facility Safety Signs; 2011 (Reaffirmed 2017).

B. ANSI Z535.4 - American National Standard for Product Safety Signs and Labels; 2011 (Reaffirmed 2017).

C. CEC - California Electrical Code; 2022 Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. UL 969 - Marking and Labeling Systems; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.

B. Sequencing:
1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.
2. Do not install identification products until final surface finishes and painting are complete.

1.5 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product.

1.6 QUALITY ASSURANCE

A. Comply with requirements of CEC.

1.7 FIELD CONDITIONS

A. Do not install adhesive products when ambient temperature is lower than recommended by manufacturer.

PART 2 PRODUCTS

2.1 IDENTIFICATION REQUIREMENTS

A. Identification for Equipment:
1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
a. Switchboards:
1) Identify ampere rating.
2) Identify voltage and phase.
3) Identify power source and circuit number. Include location when not within sight of equipment.
4) Use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.
b. Panelboards:
1) Identify ampere rating.
2) Identify voltage and phase.
3) Identify power source and circuit number. Include location when not within sight of equipment.
4) Identify main overcurrent protective device. Use identification label for panelboards with a door. For power distribution panelboards without a door, use identification nameplate.
5) Use typewritten circuit directory to identify load(s) served for panelboards with a door. Identify spares and spaces using pencil.
6) For power panelboards without a door, use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.
c. Transformers:

1) Identify kVA rating.
2) Identify voltage and phase for primary and secondary.
3) Identify power source and circuit number. Include power source location when not within sight of equipment.
4) Identify load(s) served. Include load location when not within sight of equipment.

d. Enclosed switches, circuit breakers, and motor controllers:
1) Identify voltage and phase.
2) Identify power source and circuit number. Include power source location when not within sight of equipment.
3) Identify load(s) served. Include load location when not within sight of equipment.

e. Time Switches:
1) Identify load(s) served and associated circuits controlled. Include location.

f. Centralized Emergency Lighting Inverters:
1) Identify input and output voltage and phase.
2) Identify power source and circuit number for normal power source. Include location when not within sight of equipment.
3) Identify load(s) served. Include location.

g. Transfer Switches:
1) Identify voltage and phase.
2) Identify power source and circuit number for both normal power source and standby power source. Include location when not within sight of equipment.
3) Identify load(s) served. Include location when not within sight of equipment.
4) Identify short circuit current rating based on the specific overcurrent protective device type and settings protecting the transfer switch.
5) Identify type of loads served (e.g. Required Emergency, Required Standby, Optional Standby)

h. Electricity Meters:
1) Identify load(s) metered.
2) Unique meter identifier, use identification label.

2. Service Equipment:
a. Use identification nameplate to identify each service disconnecting means.
b. For buildings or structures supplied by more than one service, or any combination of branch circuits, feeders, and services, use identification nameplate or means of identification acceptable to authority having jurisdiction at each service disconnecting means to identify all other services, feeders, and branch circuits supplying that building or structure. Verify format and descriptions with authority having jurisdiction.

3. Emergency System Equipment:
   a. Use identification nameplate or voltage marker to identify emergency system equipment in accordance with CEC.
   b. Use identification nameplate at each piece of service equipment to identify type and location of on-site emergency power sources.
   c. Use identification nameplate to identify emergency operating instructions for emergency system equipment.
4. Use identification nameplate to identify switchboards and panelboards utilizing a high leg delta system in accordance with CEC.
5. Use identification nameplate to identify disconnect location for equipment with remote disconnecting means.
6. Use identification label on inside of door at each fused switch to identify required NEMA fuse class and size.
7. Use identification label to identify overcurrent protective devices for branch circuits serving fire alarm circuits. Identify with text "FIRE ALARM CIRCUIT".
8. Use field-painted floor markings or floor marking tape to identify required equipment working clearances.
9. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by CEC including but not limited to the following.
   a. Service equipment.
   b. Industrial control panels.
   c. Motor control centers.
   d. Elevator control panels.
10. Use warning signs to identify electrical hazards for entrances to all rooms and other guarded locations that contain exposed live parts operating at 600 V nominal or less with the word message "DANGER; Electrical hazard; Authorized personnel only" or approved equivalent.
11. Use warning labels, identification nameplates, or identification labels to identify electrical hazards for equipment where multiple power sources are present with the word message "DANGER; Hazardous voltage; Multiple power sources may be present; Disconnect all electric power including remote disconnects before servicing" or approved equivalent.

B. Identification for Conductors and Cables:
   1. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.

2. Use wire and cable markers to identify connected grounding electrode system components for grounding electrode conductors.

C. Identification for Raceways:
1. Use voltage markers to identify highest voltage present for accessible conduits 2 inch (53 mm) trade size and larger at maximum intervals of 20 feet.
2. Use factory-painted conduits or field painted conduits to identify systems other than normal power system for accessible conduits. Refer to section 26 05 33.13 for color coding and additional requirements.
3. Use identification labels, handwritten text using indelible marker, or plastic marker tags to identify circuits enclosed for accessible conduits at wall penetrations, at floor penetrations, at roof penetrations, and at equipment terminations when source is not within sight.
4. Use identification labels, handwritten text using indelible marker, or plastic marker tags to identify spare conduits at each end. Identify purpose and termination location.
5. Use underground warning tape to identify underground raceways.

D. Identification for Boxes:
1. Use voltage markers to identify highest voltage present.
2. Use identification labels or handwritten text using indelible marker to identify circuits enclosed.
   a. For exposed boxes in public areas, use only identification labels.
3. Use warning labels to identify electrical hazards for boxes containing exposed live parts or exposed conductors operating at over 600 V nominal with the word message "DANGER; HIGH VOLTAGE; KEEP OUT".

E. Identification for Devices:
1. Identification for Communications Devices: Comply with Section 27 10 00.
2. Use identification label to identify fire alarm system devices.
   a. For devices concealed above suspended ceilings, provide additional identification on ceiling tile below device location.
3. Use identification label to identify serving branch circuit for all receptacles.
4. Use identification label to identify load controlled for wall-mounted control devices controlling loads that are not visible from the control location and for multiple wall-mounted control devices installed at one location.

F. Identification for Luminaires:
1. Use permanent red dot on luminaire frame to identify luminaires connected to emergency power system.

2.2 IDENTIFICATION NAMEPLATES AND LABELS

A. Identification Nameplates:
   1. Manufacturers:
      a. Brimar Industries, Inc: www.brimar.com/#sle.
      b. Seton Identification Products: www.seton.com/#sle.
   2. Materials:
      a. Indoor Clean, Dry Locations: Use plastic nameplates.
      b. Outdoor Locations: Use plastic or aluminum nameplates suitable for exterior use.
   3. Plastic Nameplates: Two-layer or three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch; engraved text.
      a. Exception: Provide minimum thickness of 1/8 inch when any dimension is greater than 4 inches.
   4. Aluminum Nameplates: Anodized; minimum thickness of 1/32 inch; engraved or laser-etched text.
   5. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch high; Four, located at corners for larger sizes.

B. Identification Labels:
   1. Manufacturers:
      a. Brady Corporation: www.bradyid.com/#sle.
      b. Brother International Corporation: www.brother-usa.com/#sle.
      c. Panduit Corp: www.panduit.com/#sle.
   2. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
      a. Use only for indoor locations.
   3. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.

C. Format for Equipment Identification:
   1. Minimum Size: 1 inch by 2.5 inches.
   2. Legend:
      a. System designation where applicable:
         1) Emergency Power System: Identify with text "EMERGENCY".
         2) Standby Power System: Identify with text "STANDBY"
         3) Fire Alarm System: Identify with text "FIRE ALARM".
      b. Equipment designation or other approved description.
   3. Text: All capitalized unless otherwise indicated.
   4. Minimum Text Height:
      a. System Designation: 1 inch.
      b. Equipment Designation: 1/2 inch.

5. Color:
   a. Normal Power System: White text on black background.
   b. Emergency Power System: White text on red background.

D. Format for General Information and Operating Instructions:
1. Minimum Size: 1 inch by 2.5 inches.
2. Legend: Include information or instructions indicated or as required for proper and safe operation and maintenance.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height: 1/4 inch.
5. Color: Black text on white background unless otherwise indicated.

E. Format for Caution and Warning Messages:
1. Minimum Size: 2 inches by 4 inches.
2. Legend: Include information or instructions indicated or as required for proper and safe operation and maintenance.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height: 1/2 inch.
5. Color: Black text on yellow background unless otherwise indicated.

F. Format for Receptacle Identification:
1. Minimum Size: 3/8 inch by 1.5 inches.
2. Legend: Power source and circuit number or other designation indicated.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height: 3/16 inch.
5. Color: Black text on clear background.

G. Format for Control Device Identification:
1. Minimum Size: 3/8 inch by 1.5 inches.
2. Legend: Load controlled or other designation indicated.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height: 3/16 inch.
5. Color: Black text on clear background.

H. Format for Fire Alarm Device Identification:
1. Minimum Size: 3/8 inch by 1.5 inches.
2. Legend: Designation indicated and device zone or address.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height: 3/16 inch.
5. Color: Red text on white background.

2.3 WIRE AND CABLE MARKERS

A. Manufacturers:
1. Brady Corporation: www.bradyid.com/#sle.
2. HellermannTyton: www.hellermanntyton.com/#sle.

3. Panduit Corp: www.panduit.com/#sle.

B. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl cloth, wrap-around self-adhesive vinyl self-laminating, heat-shrink sleeve, plastic sleeve, plastic clip-on, or vinyl split sleeve type markers suitable for the conductor or cable to be identified.

C. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.

D. Legend: Power source and circuit number or other designation indicated.

E. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.

F. Minimum Text Height: 1/8 inch.

G. Color: Black text on white background unless otherwise indicated.

2.4 VOLTAGE MARKERS

A. Manufacturers:
1. Brady Corporation: www.bradyid.com/#sle.
2. Brimar Industries, Inc: www.brimar.com/#sle.
3. Seton Identification Products: www.seton.com/#sle.

B. Markers for Conduits: Use factory pre-printed self-adhesive vinyl, self-adhesive vinyl cloth, or vinyl snap-around type markers.

C. Markers for Boxes and Equipment Enclosures: Use factory pre-printed self-adhesive vinyl or self-adhesive vinyl cloth type markers.

D. Minimum Size:
1. Markers for Equipment: 1 1/8 by 4 1/2 inches.
2. Markers for Conduits: As recommended by manufacturer for conduit size to be identified.
3. Markers for Pull Boxes: 1 1/8 by 4 1/2 inches.
4. Markers for Junction Boxes: 1/2 by 2 1/4 inches.

E. Legend:
1. Markers for Voltage Identification: Highest voltage present.
2. Markers for System Identification:
   a. Emergency Power System: Text "EMERGENCY".

F. Color: Black text on orange background unless otherwise indicated.

2.5 UNDERGROUND WARNING TAPE

A. Manufacturers:
1. Brady Corporation: www.bradyid.com/#sle.
2. Brimar Industries, Inc: www.brimar.com/#sle.
3. Seton Identification Products: www.seton.com/#sle.

B. Materials: Use foil-backed detectable type polyethylene tape suitable for direct burial, unless otherwise indicated.

C. Foil-backed Detectable Type Tape: 3 inches wide, with minimum thickness of 5 mil, unless otherwise required for proper detection.

D. Legend: Type of service, continuously repeated over full length of tape.

E. Color:
   1. Tape for Buried Power Lines: Black text on red background.
   2. Tape for Buried Communication, Alarm, and Signal Lines: Black text on orange background.

2.6 FLOOR MARKING TAPE

A. Manufacturers:
   1. Brady Corporation: www.bradyid.com/#sle.
   2. Brimar Industries, Inc: www.brimar.com/#sle.
   3. Seton Identification Products: www.seton.com/#sle.

B. Floor Marking Tape for Equipment Working Clearance Identification: Self-adhesive vinyl or polyester tape with overlaminate, 3 inches wide, with alternating black and white stripes.

2.7 WARNING SIGNS AND LABELS

A. Manufacturers:
   1. Brimar Industries, Inc: www.brimar.com/#sle.
   2. Clarion Safety Systems, LLC: www.clarionsafety.com/#sle.
   3. Seton Identification Products: www.seton.com/#sle.

B. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.

C. Warning Signs:
   1. Materials:
      a. Indoor Dry, Clean Locations: Use factory pre-printed rigid plastic or self-adhesive vinyl signs.
      b. Outdoor Locations: Use factory pre-printed rigid aluminum signs.
   2. Rigid Signs: Provide four mounting holes at corners for mechanical fasteners.
   3. Minimum Size: 7 by 10 inches unless otherwise indicated.

D. Warning Labels:
   1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
   2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
   3. Minimum Size: 2 by 4 inches unless otherwise indicated.

PART 3 EXECUTION

3.1 PREPARATION

A. Clean surfaces to receive adhesive products according to manufacturer's instructions.

3.2 INSTALLATION

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

B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
   1. Surface-Mounted Equipment: Enclosure front.
   2. Flush-Mounted Equipment: Inside of equipment door.
   3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
   4. Elevated Equipment: Legible from the floor or working platform.
   5. Branch Devices: Adjacent to device.
   6. Interior Components: Legible from the point of access.
   7. Conduits: Legible from the floor.
   8. Boxes: Outside face of cover.
   9. Conductors and Cables: Legible from the point of access.
   10. Devices: Outside face of cover.

C. Install identification products centered, level, and parallel with lines of item being identified.

D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.

E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.

F. Install underground warning tape above buried lines with one tape per trench at 3 inches below finished grade.

G. Secure rigid signs using stainless steel screws.

H. Mark all handwritten text, where permitted, to be neat and legible.

3.3 FIELD QUALITY CONTROL

A. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.

END OF SECTION

SECTION 26 05 83
WIRING CONNECTIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Electrical connections to equipment.

1.2 RELATED REQUIREMENTS

A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables.

B. Section 26 05 33.13 - Conduit for Electrical Systems.

C. Section 26 05 33.16 - Boxes for Electrical Systems.

1.3 REFERENCE STANDARDS

A. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (Reaffirmed 2020).

B. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2021.

C. CEC - California Electrical Code; 2022 Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.
   2. Determine connection locations and requirements.

B. Sequencing:
   1. Install rough-in of electrical connections before installation of equipment is required.
   2. Make electrical connections before required start-up of equipment.

1.5 SUBMITTALS

A. Product Data: Provide wiring device manufacturer’s catalog information showing dimensions, configurations, and construction.

1.6 QUALITY ASSURANCE

A. Comply with requirements of CEC.

B. Products: Listed, classified, and labeled as suitable for the purpose intended.

C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

PART 2 PRODUCTS

2.1 MATERIALS

A. Cords and Caps: NEMA WD 6; match receptacle configuration at outlet provided for equipment.
   1. Colors: Comply with NEMA WD 1.
   2. Cord Construction: CEC, Type SO, multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.
   3. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.

B. Disconnect Switches: As specified in Section 26 28 16.16 and in individual equipment sections.

C. Wiring Devices: As specified in Section 26 27 26.

D. Flexible Conduit: As specified in Section 26 05 33.13.

E. Wire and Cable: As specified in Section 26 05 19.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that equipment is ready for electrical connection, wiring, and energization.

3.2 ELECTRICAL CONNECTIONS

A. Make electrical connections in accordance with equipment manufacturer's instructions.

B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.

C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.

D. Provide receptacle outlet to accommodate connection with attachment plug.

E. Provide cord and cap where field-supplied attachment plug is required.

F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.

G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.

H. Install terminal block jumpers to complete equipment wiring requirements.

I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

END OF SECTION

SECTION 27 00 00
COMMUNICATIONS BASIC REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. This Section specifies the common administration basic requirements and common methods for all low voltage systems installation work included under Division 27 and 28 and where those requirements differ from the requirements of this section, the more stringent shall govern.

1.02 STANDARDS, REGULATIONS, AND CODES REFERENCES

A. The following Standards, Regulations and Codes apply to work specified in the Contract Documents.

1. Applicable State and Local Codes.
2. California Building Code and California Electrical Code, Current Editions.
3. BICSI TDMM (Telecommunications Distribution Methods Manual), 11th Edition 2006.
4. ANSI/TIA/EIA-568-B.1. Commercial Building Telecommunications Cabling Standard,
5. ANSI/TIA/EIA-568-B.1-2. Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements, Addendum 2, Grounding and Bonding Specifications for Screened Balanced Twisted-Pair Horizontal Cabling.
6. ANSI/TIA/EIA-568-B.1-3. Commercial Building Telecommunications Cabling Standard.
7. ANSI/TIA/EIA-568-B.1-4. Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements, Addendum 4, Recognition of Category 6 and Category Cat 6A and 50 nm Laser-Optimized 50/125 um Multimode Optical Fiber Cabling.
8. ANSI/TIA/EIA-568-B.1-2. Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted-Pair Cabling Components.
9. ANSI/TIA/EIA-568-B.2-1. Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted-Pair Cabling Components, Addendum 1,Transmission Performance Specifications for 4-Pair 100 Ohm Category 6 Cabling.
10. ANSI/TIA/EIA-568-B.2-10 (draft 2.0). Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted-Pair Cabling Components, Addendum 10, Transmission Performance Specifications for 4-Pair 100 Ohm Augmented Category 6 Cabling.
11. ANSI/TIA/EIA-568-B3.3 Optical Fiber Cabling Components Standard.
12. TIA-569-B. Commercial Building Standard for Telecommunications Pathways and Spaces.
13. ANSI/TIA/EIA-606-A. Administration Standard for Commercial Telecommunications Infrastructure.

14. ANSI/TIA/EIA-607-A. Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications.
15. TIA/EIA TSB-67 Transmission Performance Specifications for Field Testing of Unshielded Twisted-Pair Cabling Systems.
16. TIA/EIA TSB-72 Centralized Optical Fiber Cabling Guidelines.

1.03 DEFINITIONS

A. The following is a list of abbreviations generally used in Divisions 27 & 28:
   1. ADA - Americans with Disabilities Act
   2. AHJ - Authority Having Jurisdiction
   3. ANSI - American National Standards Institute
   4. APWA - American Public Works Association
   5. ASTM - American Society for Testing and Materials
   6. CBC - California Building Code
   7. CEC - California Electrical Code
   8. CFC - California Fire Code
   9. FCC - Federal Communications Commission
   10. HVAC - Heating, Ventilating and Air Conditioning
   11. IEC - International Electro-technical Commission
   12. IEEE - Institute of Electrical and Electronics Engineers.
   13. IETA - International Electrical Testing Association
   14. FM - FM Global
   15. NEMA - National Electrical Manufacturers Association
   16. NFPA - National Fire Protection Association
   17. OSHA - Occupational Safety and Health Administration
   18. UL - Underwriters Laboratories Inc.

B. Provide: To furnish and install, complete and ready for the intended use.

C. Furnish: Supply and deliver to the project site, ready for unpacking, assembly, and installation.

D. Install: Includes unloading, unpacking, assembling, erecting, installing, applying, finishing, protecting, cleaning and similar operations at the project site to complete items of work furnished by others.

E. Following is a list of commonly used terms in Division 27:
   1. Active Equipment: Electronic equipment used to develop various WAN and LAN services.

2. Backbone: Collective term sometimes used to describe the campus and vertical distribution subsystem facilities and media interconnecting service entrances, communications rooms, and communications cabinets.
3. Bonding: Permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to safely conduct currents likely to be imposed on it.
4. Cabinet: Wall-mounted modular enclosure designed to house and protect electronic equipment.
5. Cable Tray: Vertical or horizontal open supports, usually made of aluminum or steel, that are fastened to a building ceiling or wall. Cables are laid in and fastened to the trays. A cable tray is not a raceway.
6. Campus: Grounds and buildings of a multi-building premises environment.
7. Channel: The end-to-end transmission path between two points at which application specific equipment is connected; may include one or more links, cross-connect jumper and/or patch cords, and work area station cords. Does not include connection to active equipment.
8. Cross-Connect: Equipment used to terminate and tie together communications circuits.
9. Cross-Connect Jumper: A cluster of twisted-pair conductors without connectors used to establish a circuit by linking two cross-connect termination points.
10. Fiber Optic Distribution Unit (FDU): Cabinet with terminating equipment used to develop fiber optic cross-connect facilities. Also known as LIU.
11. Grounding: a conducting connection to earth, or to some conducting body that serves in place of earth.
12. Hinged Cover Enclosure: Wall-mounted box with a hinged cover that is used to house and protect electrical devices.
13. Horizontal: Pathway facilities and media connecting the MDF or IDF to Telecommunications Outlets.
14. Intermediate Distribution Frame (IDF): Data networking equipment rack and/or location that serves an individual area, floor or building. Downstream from the MDF.
15. Jack: Receptacle used in conjunction with a plug to make electrical contact between communications circuits, e.g., eight-position/eight-contact modular jacks.
16. Link: A transmission path between two points, not including terminal equipment, work area cables, and equipment cables; one continuous section of conductors or fiber, including the connecting hardware at each end.
17. Local Area Network (LAN): Data transmission facility connecting several communicating devices, typically Ethernet and the network is limited to a single campus.
18. Main Distribution Frame (MDF): Initial (main) data network equipment rack and/or location. Only one MDF occurs per site and may serve many downstream IDFs.
19. Media: The type of cable (e.g., twisted-pair, coaxial, or fiber optic) used to provide signal transmission paths.

20. Minimum Point of Entry (MPOE): The location where the service provider hands off connection and responsibility for service to on premise customer owned equipment.
21. Modular plug: An eight-position, eight-conductor end-of-wire electrical connector used with Category rated cable.
22. Passive Equipment: Non-electronic hardware and apparatus, e.g., equipment racks, cable trays, electrical protection, wiring blocks, FDUs, etc.
23. Patch Cord: A length of copper or fiber cable with connectors on both ends used to join communications circuits at MDF/IDF and end stations.
24. Patch Panel: System of terminal blocks or connectors used with patch cords that facilitate the administration of cross-connect fields.
25. Pathway: Facility for the placement of communications cable. A pathway facility can be composed of several components including conduit, wireway, cable tray, surface raceway, underfloor systems, raised floor, ceiling support wires, etc.
26. Protectors: Electrical protection devices used to limit foreign voltages on metallic communications circuits.
27. Raceway: An enclosed channel designed expressly for holding wires or cables; may either conductive metal or insulating plastic. The term includes conduit, tubing, wireway, underfloor raceway, and surface raceway; does not include cable tray.
28. Rack: An open or enclosed structure, typically made of aluminum or steel, used to mount equipment; usually referred to as an equipment rack. Maybe freestanding and floor mounted or a wall mounted cabinet. Industry standard 19" width spacing.
29. Wiring Block: Punch down terminating equipment used to develop twisted pair cross-connect facilities.

1.04 PRODUCT AVAILABILITY

A. Products with long lead times are to be brought to the attention of the project manager.

1.05 PRODUCT SUBMITTALS

A. See Division 01 Submittals for more requirements

1.06 SUBSTITUTION LIMITATIONS

A. Equivalent product(s) may be considered for substitution for those products specified, however, the equivalent product(s) must be approved, and show demonstrated and documented equivalence to the product(s) specified. Documentation includes but is not limited to product samples, data sheets, and actual test data. The request for product substitution, and supporting documentation, must be submitted, in writing to the Project Manager/Designer.

B. See Division 01 Substitutions for more requirements

1.07 QUALITY ASSURANCE

A. Conform to requirements of the CEC, latest adopted version with amendments by local AHJs.

B. Conform to the latest adopted version of the CBC with amendments by local AHJs.

C. Obtain and pay for electrical permits, plan review, and inspections from local AHJs.

D. Furnish products listed by UL or other testing firm acceptable to AHJ.

E. Conform to requirements of the serving electric, telephone, broadband and cable television utilities.

F. Contractor Qualifications:
1. Minimum of five years' experience in the design, installation, testing, and maintenance of low-voltage systems.
2. Maintain a local service facility which stocks spare devices and/or components for servicing systems.
3. Have performed successful installation and maintenance of at least three projects similar in scope and size. Be able to provide project references for these three projects, including scope of Work, project type, owner/user contact name and telephone number.
4. The contractor selected for this project must be certified by the manufacturer of the products and utilize these components for completion of work.
5. Holds and maintains a valid California C-7 or C-10 State Contractors License and can exhibit validity upon request.
6. A list of test equipment proposed for use in verifying the installed integrity of copper and fiber optic cable systems used.
7. A technical resume of experience for the contractor's Project Manager and on-site installation supervisor who will be assigned to this project.
8. A list of technical product training attended by the contractor's personnel that will install the specified manufacturer system.
9. List of Sub-Contractor(s) who will assist the contractor in the performance of this work.

1.08 SEQUENCING AND SCHEDULING

A. For the proper execution of the work, cooperate with other tradecrafts and contracts as needed.

B. To avoid installation conflicts, thoroughly examine the complete set of Contract Documents. Resolve conflicts with Project Manager/Designer prior to installation.

C. Prior to installation of communications cable to equipment requiring connections, examine the manufacturer's shop drawings, wiring diagrams, product data, and installation instructions. Verify that the electrical characteristics detailed in the Contract Documents are consistent with the electrical characteristics of the actual equipment being installed. When inconsistencies occur request clarification from Project Manager/Designer.

1.09 SHOP DRAWINGS

A. Shop Drawings: When required by individual Specification Sections, provide shop drawings which include physical characteristics, electrical characteristics, device layout plans, point-to-point wiring diagrams for all connections, and the like. Refer to individual Specification Sections for additional requirements for the shop drawings.

1.10 WARRANTY

A. Provide an extended manufacturer’s warranty on the Backbone and Horizontal Communications systems as specified in other sections of Division 27.

1.11 CLOSE OUT DOCUMENTS

A. Final coordination drawings, with as-built information added, are to be submitted as record drawings at completion of project.

B. Record Drawings:
   1. Show changes and deviations from the Construction Drawings. Include written Addendum and change order items.
   2. Show exact routes of pathway facilities and service entrance conduits.
   3. Show the exact location of racks, cabinets, mounting frames and the like.

C. Operation and Maintenance Documentation: Provide copies of certificates of code authority acceptance, product data, guarantees, warranties, installation guides, maintenance guides and the like.

D. Inspection and/or testing: Submit testing reports for testing that was performed.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Provide like items from one manufacturer, such as wire/cable, jacks, modular plugs, patch panels, equipment connection cords, wall plates, and the like. See individual sections for detailed information.

2.02 MATERIALS

A. Provide new electrical materials of the type and quality detailed, listed by UL, bearing their label wherever standards have been established. Indicated brand names and catalog numbers are used to establish standards of performance and quality.

B. Provide material and equipment that is acceptable to AHJ as suitable for the use indicated. For example, provide plenum rated cable in ceilings that are utilized as air return plenums.

C. Include special features, finishes, accessories, and other requirements as described in the Contract Documents regardless of the item's listed catalog number.

D. Provide incidentals not specifically mentioned herein or noted on Drawings, but needed to complete the system, in a safe and satisfactory working condition.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Construction Documents:
1. Drawings are diagrammatic with symbols representing communications equipment, outlets, and wiring.
2. Electrical symbols indicating wiring and equipment shown in the Contract Documents are included in the Contract unless specifically noted otherwise.
3. Examine the entire set of Drawings to avoid conflicts with other systems. Determine exact route and installation of communications wiring and equipment with conditions of construction.

3.02 INSTALLATION

A. Install communications equipment completely as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of the communications equipment, examine the instructions thoroughly. When requirements of the installation instructions conflict with the Contract Documents, request clarification from Project Manager/Designer prior to proceeding with the installation.

B. Do not install communications equipment in obvious passages, doorways, scuttles, or crawl spaces which would impede or block the passage's intended usage.

C. Do not install communications equipment in locations where it would obviously be subject to damage during normal usage.

3.03 FIELD QUALITY CONTROL

A. Tests: Conduct tests of equipment and systems to demonstrate compliance with requirements specified in Division 27 & 28. Refer to individual Specification Sections for required tests. Document tests and include in Closeout Documents.

3.04 CLEANING

A. Remove dirt and debris caused by the execution of the communications work.

B. Leave the entire communications system installed under this Contract in a clean, dust-free, and proper working order.

C. Vacuum clean interiors of new and modified electrical signal and communication equipment enclosures.

END OF SECTION

SECTION 27 05 00
COMMON WORK RESULTS FOR COMMUNICATIONS

PART 1 - GENERAL

1.01 SUMMARY

A. This section specifies the basic materials and methods for all low voltage pathways installation work included under Division 27 and 28 and where those requirements differ from the requirements of this section, the more stringent shall govern.

B. This section adds refinements to Division 26 that apply to Communications and extra-low-voltage systems.

1.02 SCOPE

A. Materials and/or methods for the following.
   1. Communication services
   2. Grounding
   3. Fasteners
   4. Hangers and supports
   5. Conduits/Backboxes/Raceways
   6. Underground
   7. Sleeves and penetrations

1.03 SUBMITTALS

A. Submittals shall be done in accordance with District submittal procedures, see Division 01 Submittals for requirements.

1.04 RELATED REQUIREMENTS

A. Division 07 – Thermal and Moisture Protection

B. Division 26 – Electrical

C. 27 00 00 – Communications Basic Requirements

1.05 REFERENCES

A. ANSI American Nation Standards Institute

B. NFPA 70 – National Electrical Code

C. UL Underwriters Laboratory

D. California Building Code (CBC)

E. California Electrical Code (CEC)

1.06 WARRANTY

A. Refer to Division 01 -– Warranties

PART 2 – PRODUCTS

2.01 All products used on this project shall bear the label and be approved by Underwriters Laboratories unless otherwise approved in writing by District.

2.02 FASTENERS

A. Mounting hardware and anchors recommended by the manufacturer of any material that shall be mounted to the building or structure.
   1. Sheet rock / drywall / wall board: Easy Anchor, toggle bolt, other spread type anchor with load distribution, or approved equal.
   2. Concrete / cinder block / solid masonry: Expanding compression type lag, expanding compression type bolt, expanding compression type, all-thread with nuts, or approved equal.
   3. Tile / Stucco / hollow masonry: Toggle bolts or approved equal.
   4. Wood: Lag screws, wood screws, or approved equal.
   5. Metal: Beam clamps, sheet metal screws, self-drilling screws or approved equal.

2.03 HANGERS AND SUPPORT

A. D-RINGS
   1. Commercial grade

B. J-HOOKS
   1. Panduit J-Pro

2.04 SURFACE RACEWAY

A. Existing: Match raceway already installed in facility, unless otherwise instructed in project documentation.
B. New: Wiremold 2300 and 5400 raceway systems are acceptable.

2.05 CONDUITS AND ACCESSORIES

A. CONDUITS
   1. See Division 26 for requirements.

   2. Conduit for Fire Alarm applications shall be red in color (non-accessible areas are excluded).

   3. All new conduits shall be sized accordingly to achieve a 40% maximum fill ratio with initial cables installed.

   4. Underground conduits shall be Schedule 40 PVC.

B. INNERDUCT
   1. Orange corrugated HDPE (High Density Polythylene) Innerduct shall be used for fiber optic cable protection in interior locations.

   2. Fabric multi-cell innerduct is approved for underground conduits 2” and larger.

C. FITTINGS:
   1. See Division 26 for requirements.

   2. Conduit bodies, condulets, “LBs”, pulling elbows, and any sharp bend fittings are strictly prohibited for communication Cat6A and fiber optic cables. Appropriate conduit sweeps are required.

D. PULL LINE
   1. Minimum 1/8" diameter, or larger braided line of polypropylene or continuous fiber polyolefin. The minimum breaking strength of 1/8 in. line is 200 lbs.

2.06 BACKBOXES, JUNCTION BOXES AND FLOOR BOXES

A. Galvanized one-piece or welded pressed steel type. Boxes shall be at least 2-1/8" deep, 4" square for 1 or 2 gang devices, with device rings. Boxes mounted in wall or ceiling finishes shall be furnished with device rings to match wall surface depth. Provide blank cover for all boxes without fixture or device.

B. Provide blank cover for all surface boxes without a device, sized to match the surface box. No edge of a blank cover shall extend past the edge of a surface box.

C. Junction boxes, larger than 8", located indoors shall be hinged, NEMA-1 rated.

D. Junction boxes, larger than 8", located on exterior walls, or in wet or damp locations shall be hinged, NEMA-3R.

E. Junction boxes of any size located on rooftops (including canopy rooftops) shall be hinged, NEMA 4.

F. Provide and install tamper-proof screws for all exterior boxes.

G. Junction boxes used for Fire Alarm systems are to be red in color with red colored cover plates.

2.07 GROUND BOXES

A. See Division 26 and below for requirements.

B. Approved manufactures are Jensen, Christy or approved equal.

C. All ground boxes shall have metal traffic-rated lids with permanent factory markings of COMM or COMMUNICATIONS.

D. Minimum size is 17" x 30"

E. For AT&T service feeds the requirement is for 30"x48" Intercept Pullboxes. Jensen SKU 100020251/Mod # K304836AT was referenced by AT&T.

F. For Comcast - Christy B2436 at service tie in and B1730 as an inline pullboxes are acceptable.

2.08 PENETRATION SEALING

A. Firestopping: Provide UL Listed Firestopping materials for all penetrations through rated assemblies (walls / floors). See Division 07 for more information.

B. Draft stopping: Foam sealant for use around conduit penetrations (in non-rated assemblies) to prevent passage of air, smoke, and/or toxic gas. See Division 07 for more information.

C. Weatherproofing: Weatherproof sealant for use around conduit penetrations in exterior walls to prevent the intrusion of water. See Division 07 for more information.

2.09 GROUNDING BUS BAR

A. Copper bus bar 2"x10"x1/4" minimum size with stand-off brackets and insulators, pre-drilled and threaded mounting holes (hole qty. 12 or greater) for equipment grounding lug attachment.

PART 3 - EXECUTION

3.01 COMMUNICATION SERVICES

A. Install inground boxes, conduits, and terminal cabinets per service provider requirements.

3.02 GROUNDING

A. Ground fittings shall be UL approved for each application and installed and/or connected to system in accordance with current CEC Code requirements.

B. See Division 26 for additional requirements.

C. Install grounding bus bar per manufacturer's instructions and in each MDF and IDF.

D. All network equipment, racks, cabinets, and pathways shall be bonded to the grounding bus bars as described in the TIA 607 series of standards.

3.03 HANGERS AND SUPPORTS

A. Install hangers and supports per manufacturer's written instructions.

B. Hanger spacing shall be 48" or less and within 12" of sleeves and/or junction/back boxes.

3.04 LOW VOLTAGE PATHWAY/RACEWAYS

A. EMT conduit may be used at following locations:
   1. In dry locations in furred spaces.
   2. In partitions other than concrete or solid masonry.

B. Rigid steel conduit and fittings shall be used for vertical risers and on all roofs, overhangs, walkways, canopies, or any other location exposed to direct weather.

C. Furnish and install pull lines in all unused (empty) conduits or raceways. All pull lines shall be permanently tagged with identification at both ends.

D. Install exposed conduit neatly, parallel to or at right angles to structural members. Maintain a minimum of 12 inches of clearance from steam or hot water pipes. All installed strut channel supports should allow for future conduit attachments. The width of strut channel to match the width of the closest attached junction box. See design document details for attachment requirements.

E. Supports: Support conduit with two-hole straps or strut channel where shown in design documents and/or specified. Single-hole straps are prohibited. Coordinate supports with architectural details. Secure to wood structure by means of bolts or lag screws, to metal by means of shallow self-tapping screws, to concrete by means of insert or expansion bolts, to brickwork by means of expansion bolts, and to hollow masonry or stucco by means of toggle bolts.

F. Spacing for all EMT and rigid steel conduit supports shall be as follows unless otherwise specified in design documents details:

1. Surface conduit spacing and supports and unless otherwise specified or shown on drawing details:
    a. EMT – Size 3/4" to 2" – 4' maximum spacing (3 each supports per 10' conduit length) and 12" from each end of conduit at coupling, connector or 90-degree bend.

    b. Rigid steel – Size 3/4" to 2" – 4' maximum spacing (3 each supports per 10' conduit length) and 12" from each end of conduit at coupling, connector or 90-degree bend.

G. If conduit is designated for low voltage use, no more than a total of 360 degrees of conduit bend radius will be allowed between pull boxes.

H. All junction boxes shall be connected to conduits using appropriate connecting hardware (i.e. box connectors).

I. Clean, prep and paint with white primer all exposed conduit, junction boxes, channel strut, fittings, and accessories.

J. Before pulling any conductors into an underground PVC conduit (new or existing), the conduit shall be first be proofed by pulling through a mandrel of a diameter ¼ in. smaller

than the conduit inside dia., followed by a swab of the same diameter as the conduit inside diameter.

K. Non-metallic raceway to be installed with mechanical fasteners only, do not remove adhesive tape backing.

L. Capping

1. Cap conduits during construction with manufactured seals. Swab out conduits before installing wires.

2. Cap all empty conduits below grade and in pull boxes with manufacturer's caps to prevent entrance of debris, attach pull string to cap.

M. Underground Conduit

1. Service provider conduits shall be:
   a. AT&T - 1-4" (fiber only) or 2-4" (fiber and copper)

   b. Comcast - 1-2"

2. #10 tracer wire or tracer tape is required for all underground Division 27 PVC conduits.

3.05 J-BOXES

A. Screws shall be used to attach boxes, and must be accurately placed for finish, independently and securely supported by adequate wood backing or by manufactured adjustable channel type heavy-duty box hangers.

1. Boxes shall be attached to metal studs with metal box hangers.

2. Boxes installed in masonry tile or concrete block construction shall be secured with auxiliary plates, bars or clips and be grouted in place.

B. Locate outlets at the following heights unless otherwise noted on Drawings, Specifications, current CBC or as required to meet ADA handicap requirements.

1. Data Outlets: Same height as electrical outlets

2. Telephone Wall Outlets: Above counter/backsplash height or at light switch height.

C. Low Voltage boxes shall be placed within 18" of electrical outlets.

D. For sound control, separate outlets on opposite sides of walls 16" minimum. Where outlets are less than 16" or in sound rated walls, seal airtight with fire rated sheet putty pads.

Fill gap between junction box and wall with acoustical sealant all around perimeter of junction box. Fill conduits larger than 1 1/4" with fire rated putty.

E. Installation of conduit and outlet boxes in fire-resistive walls, floors, floor-ceiling or roof-ceiling assemblies shall comply with Title 24, Part 2, Section 713.

3.06 GROUND BOXES

A. To be installed per Division 26 requirements.

B. Provisions to be made for supporting cables from the box sides (i.e., j-hooks, d-rings)

C. Install a 30" x 48" for service provider AT&T at service tie-in location and/or a 24" x 36" for service provider Comcast at service tie-in location. If less than 360-degrees of bends and less than 200 feet it is acceptable to stub in to the MPOE directly. If greater for 360-degree for bends or 200 feet for length then additional in-line ground boxes are required (30" x 48" for AT&T, 17" x 30" for Comcast). See section Part 2 – Products for more information.

3.07 SLEEVES AND CONDUIT PENETRATIONS

A. Where conduit passes through walls, ceilings, or floors with connection points to junction boxes or raceways mounted to the same wall as the penetration provide a threaded conduit and secured in place with locking rings on both sides. Bend radius requirements shall be maintained where penetrations are made through the back of raceways; junction boxes with adequate depth shall be installed to comply with this requirement.

B. Where conduit passes through walls, ceilings, or floors with connection points to junction boxes or raceways not mounted to the same wall as the penetration, provide EMT conduit and secured in place with strut channel. Box connectors shall always be used to connect EMT to junction boxes and raceways.

C. All wire and cable passing through metalwork shall be sleeved with an appropriate grommet or bushing.

D. FIRE STOPPING

1. Seal all conduit penetrations through fire rated walls and floors fire and smoke tight in conformance with current CBC and current CEC. See Division 07 for more information.

E. DRAFT STOPPING

1. All non-fire rated walls must be draft stopped and sealed. Submit method to be used for approval by inspector and/or project manager. Mineral wool is one product that may be used. See Division 07 for more information.

F. WEATHER SEALING

1. All exterior penetrations shall be sealed watertight. The contractor shall use silicone rubber caulk or other approved methods and materials. Submit method and material with inspector and/or project manager. See Division 07 for more information.

3.08 CLEANING

A. Clean all work prior to concealing, painting, and acceptance. Performed in stages if directed.

B. Clean and repair soiled or damaged painted exposed work and match adjoining work before final acceptance.

C. Remove debris from inside and outside of equipment and enclosures.

3.09 FINAL DOCUMENT SUBMITTALS

A. See 27 00 00 for more information.

END OF SECTION

SECTION 27 10 00
STRUCTURED CABLING

PART 1 – GENERAL

1.01 SUMMARY

A. This section specifies equipment, accessories, materials, installation, configuration, and testing requirements for a complete and operable Structured Cabling communications system. The system shall provide highly reliable and high-performance data communication from main distribution frame (MDF) through each intermediate distribution frame (IDF) to end points requiring fiber optics and/or copper cabling and associated equipment.

B. This section condenses sections 27 11 00 – Communications Equipment Room Fittings, 27 13 00 – Communications Backbone Cabling, 27 15 00 – Communications Horizontal Cabling and 27 16 00 – Communications Connecting Cords into one comprehensive section.

1.02 SCOPE

A. The work will include but not be limited to the following objectives:
1. Contractor shall furnish and install all required components and accessories as outlined in the design documents for a complete and operable turn-key system.
2. Quality workmanship is a high priority for the District and the Contractor shall be held to a high-level of professional workmanship. Contractors unfamiliar with the District's standards shall familiarize themselves with the standards and requirements prior to beginning work.
3. The Contractor shall furnish and install fire-treated ¾" (three quarter inch) plywood for the MDF room (all walls, from floor level to 8' high) and IDF locations (as required or indicated in the design documents).
4. The Contractor shall furnish and install a ground bus bar at the MDF and IDF rooms.
5. The Contractor shall furnish and install all required racks and cabinets.
6. The Contractor shall install owner-provided uninterruptable power supply(ies) (UPS) for the MDF and/or IDF racks.
7. The Contractor shall furnish and install all newly required conduit/raceway.
8. The Contractor shall furnish and install all wire/cable (copper/fiber optic) as required.
9. The Contractor shall terminate all strands of fiber at each fiber enclosure.
10. The Contractor shall furnish and install termination all end-point equipment (patch panels, jacks, wallplates, enclosures, etc.).
11. The Contractor shall furnish and install all patch cords (copper/fiber).
12. The Contractor shall test and certify (for warranty) the installed cable plant.

1.03 RELATED REQUIREMENTS

A. Section 01 – General Requirements

B. Section 27 00 00 – Communications

C. Section 27 05 00 – Common Work Results for Communication Systems.

1.04 INDUSTRY GUIDELINES AND STANDARDS

A. California Electrical Code (CEC) – Current adopted version

B. California Building Code (CBC) – Current adopted version.

C. ANSI/TIA-568.0-D – Generic Communications Cabling for Customer Premises.

D. ANSI/TIA-568.1-D – Commercial Building Communications Cabling Standard Part 1: General Requirements.

E. ANSI/TIA 568-C.2 – Balanced Twisted-Pair Telecommunications Cabling and Components Standards

F. ANSI/TIA 568.3-D – Optical Fiber Cabling Components Standard

G. ANSI/TIA-569-D – Commercial Building Standard for Telecommunications Pathways and Spaces.

J. ANSI/TIA-606-B – Administration Standard for the Commercial Telecommunications Infrastructure.

K. ANSI/JSTD-607-C – Commercial Building Bonding and Grounding (Earthing) Requirements for Telecommunications.

1.05 QUALIFICATIONS

A. The contractor shall possess a California C7 or C10 license.

B. The Contractor or Subcontractor shall have 5 years' documented experience.

C. The Contractor and installers shall be certified by the product manufacturer.

D. Contractor shall be a current Panduit One Partner that has completed the Structured Cabling Deployment training (Panduit Certified Installer). The Panduit partner status will be verified directly with Panduit after bid.

1. At least 30 percent of the technicians installing low-voltage copper systems on the job shall have a current Panduit Certified Copper Technicians certificate.
2. At least 30 percent of the technicians installing any Fiber Distribution Systems shall have a current Panduit Certified Fiber Technicians certificate.
3. Contractor Project Manager on site shall have completed the Panduit Structured Cabling Deployment training and hold certificates for both copper and fiber.

1.06 SYSTEM REQUIREMENTS

A. Any new installations or existing system modifications shall seamlessly integrate into the site's existing data cable plan system.

1.07 CONTRACTOR "SHOP DRAWINGS" DESIGN REQUIREMENTS

A. See section 27 00 00 for requirements.

B. Shop Drawings shall be required for this section.

1.08 SUBMITTALS

A. See section 27 00 00 for requirements.

B. Submittals shall be required for this section.

1.09 WARRANTY

A. Refer to Division 01 Warranty section.

B. See section 27 00 00 for additional requirements.

C. Contractor shall provide a 25-year Panduit Certification Plus System Warranty on all copper and fiber installations.

1.10 CLOSEOUT DOCUMENTS

A. See section 27 00 00 for requirements.

PART 2 – PRODUCTS

2.01 GENERAL

A. See Appendix A at the end of this document for pre-approved materials.

B. All products shall be new, unused and without blemishes and shall be of manufacturer's current and standard production.

C. Contractor shall confirm all equipment part numbers with the Project Manager or District prior to ordering equipment and updating submittals as required.

D. Drawings and Specifications indicate major system components, and may not show every component, connector, module, or accessory that may be required to support the operation specified. The Contractor shall provide all components needed for complete and satisfactory installation and operation.

E. Install mounting hardware and anchors as recommended by the Manufacturer of the equipment that requires mounting to the building or structure and adhere to all code requirements. See section 27 05 00 for requirements.

F. Product Availability
1. Contractor, prior to submitting a proposal, shall determine product availability and delivery time, and shall include such considerations into his proposed Contract Time.

2.02 MANUFACTURERS AND PRODUCTS

A. See Appendix A at the end of this document for pre-approved materials.

B. Substitutions require proof of equivalence and approval by District and/or its representative.

C. For maintenance and consistency with the existing installed base, data connectivity components (copper and fiber) shall be Panduit.

2.03 COPPER/FIBER OPTIC CABLES AND COMPONENTS

A. All copper cables and components shall be Cat6A rated.
   1. Cable to be reduced diameter, blue jacket.
   2. Jacks to be keystone style.

B. Data jacks system/color:
   1. Data = Blue color
   2. AP = Green color
   3. CCTV = Purple color
   4. Clock/Intercom/BMS/HVAC/Lighting = Black color
   5. Access Control = Orange color
   6. Fire Alarm/Intrusion Alarm = Red color

C. Copper patch cable color: match jack

D. 45 degree angled data jacks shall be utilized at raceway and flush box locations.

E. All fiber optic cables and components shall be single single-mode OS2 rated.

F. Fiber optic cable terminations shall be LC-Duplex style.

PART 3 – EXECUTION

3.01 ACCEPTABLE INSTALLERS

A. The components making up the structure cabling system shall only be installed by Contractors who are qualified to install, service and maintain the system.

B. Cable terminations (copper or fiber) shall be installed by manufacturer certified technicians.

C. The Contractor (or subcontractor listed at time of bid) must have at least five (5) years' experience before the Bid Opening Date.

3.02 EXAMINATION

A. The Contractor shall be required to visit the installation site(s) prior to job bidding. The Contractor acknowledges that the failure to visit the site(s) will not relieve the Contractor of the responsibility for accurate bidding and performance of the Work.

B. The Contractor shall report any discrepancies between the Specifications, Drawings, and Site Examination prior to the Bid Opening Date.

3.03 PREPARATION

A. The Contractor shall order all required parts and equipment upon receipt of approved product submittals.

B. The Contractor shall verify the availability of power where required.

3.04 SHOP DRAWINGS

A. The Contractor shall create "Shop Drawings" per section 27 00 00 for this section.

B. Submit drawings for review and approval by the Project Manager and/or Designer.

3.05 INSTALLATION

A. ENTRANCE FACILITIES

1. Contact telecommunications service provider and arrange for installation of demarcation point, protected entrance terminals, and housing when so directed by service provider.

2. Install underground or aerial pathways complying with recommendations in TIA/EIA-569-A, "Entrance Facilities" Article.

B. UNDERGROUND ENTRANCE PATHWAY

1. Install underground entrance pathway complying with Division 26.

C. EQUIPMENT RACKS, CABINETS, ENCLOSURES AND ACCESSORIES

1. Backboards:
   a. Shall be installed behind the rack or cabinet if the cabinet is not able to be directly attached to two vertical wall studs or blocking.
   b. Backboards shall be made of fire retardant or treated materials, squarely cut, and with sanded edges.
   c. Backboards shall be a minimum ¾" thick.
   d. The "FIRE RATED" stamp shall be visible.
   e. Backboards shall be fastened with ¼" lag bolt and washer, non-recessed, with maximum spacing of 18" into 2 vertical studs. 1-1/2" embedment.
   f. Visible portions (outside of cabinet) of Backboards shall be painted.

2. All data & voice communications racks and cabinets shall be anchored in accordance with manufacturer's specifications, project specifications and/or drawn details, to walls and floors and grounded to building ground grid (not to water pipes etc.).

3. Securely mount equipment cabinet and racks to the building structure. A proper quantity of support fasteners shall be utilized. Typically lag bolts for wood installations,

wedge anchors for concrete flooring. Submit data sheets for mounting fasteners for approval before installation. Mount equipment per DSA approved drawings/details.

4. Equipment cabinet mounted on or against walls will have 3-foot clearance in front of deepest component and accessible to rear for service.

5. MDF and all IDFs shall have at least one dedicated 208V 20-amp (L6-20R) receptacle.

6. Patch Panels: Mount patch panels into the cabinet/rack.

7. Cable Management: Secure the cable bundle(s) to the rack strain relief and cable management behind the patch panels and cross connect block panels. Install horizontal cable management panels and brackets for routing and management of patch cables. Maintain TIA/EIA and BICSI standards on bundling, supporting and bend radius.

8. Surge Protected Outlet Strips: Required in MDF rack. Mount surge protected outlet strips per Manufacturer's directions. Refer to details on the Drawings for mounting location.

9. Install owner-provided UPS in MDF/IDF racks per design documents.

D. MDF/IDF GROUNDING

1. Refer to Section 27 05 00 Grounding for more requirements.

2. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least 2-inch (50-mm) clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 6 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground.

3. Bond metallic equipment (including ladder rack) to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

3.06 WORKMANSHIP

A. Quality workmanship is a high priority for the District and the Contractor shall be held to a high-level of professional workmanship.

B. The District' Project or Construction Manager will have the authority to reject Work which does not conform to the Drawings and Specifications.

C. Comply with highest industry standards, except when specified requirements indicate more rigid standards or more precise workmanship.

D. Perform Work with persons experienced and qualified to produce workmanship specified.

E. Maintain quality control over suppliers and Subcontractors.

3.07 WIRE/CABLE (COPPER/FIBER OPTIC)

A. Design, layout, size, and plan new cable runs as required.

B. All wire and cable passing through metalwork shall be sleeved by an approved grommet or bushing.

C. Conduit/raceway fill shall not exceed 40 percent of interior cross-sectional area.

D. Neatly dress and tie (Velcro) all cabling.

E. UTP cabling shall conform to a 6-foot separation requirement from the main power panel, transformers, switchgear and/or starter motors adjacent to the MDF, IDF and termination locations.

F. Fiber optic cable shall be installed directly from the MDF to each IDF.

G. Orange corrugated HDPE (High Density Polythylene) Innerduct shall be used for fiber optic cable protection in all interior locations.

H. Spicing of fiber optic cable shall be done with fusion splices.

J. Maintain proper bend radius for all cable installations.

K. Do not exceed cable manufacturer's instructions for installation pull load. Any cable damaged by excessive pull force shall be replaced by the installing contractor.

3.08 LABELING

A. MDF/IDF - Identification number in large font on front of cabinet.

B. MDF, Fiber Optic LIU Ports – IDF number and room number

C. MDF/IDF, Copper Patch Panel – Panels labeled P1, P2, P3, etc., ports labeled with room number.

D. LAN Outlet – IDF number, patch panel number, patch panel port number.

E. Cables to be labeled both ends with unique identifiers and from/to location identifiers. For Copper Cat cable IDF number, patch panel number, patch panel port number.

F. T-bar ceilings shall have device labels attached next to the device for ceiling mounted equipment and at the tile for above ceiling equipment with device type and device ID points/IP address.

3.09 CONDUIT AND RACEWAY INSTALLATION

A. See Division 26 and section 27 05 00 for requirements.

B. Conduit bodies and any other sharp bend fittings are strictly prohibited for communications cabling (copper/fiber).

C. Install proper radius conduit sweeps where required.

3.10 FIELD QUALITY CONTROL AND TESTING

A. Upon reaching substantial completion, perform a complete test and inspection of the system. If found to be installed and operating properly, notify District of your readiness to perform the formal Test & Inspection of the complete system.

B. Submit the Record Drawings (as-builts) to District for review prior to inspection.

C. During the formal Test & Inspection (Commissioning) of the system, the Contractor shall have personnel available with tools and equipment to inspect wiring, devices, and system operation.

D. If corrections are needed, the Contractor will be provided with a Punch-List of all discrepancies. Perform the needed corrections in a timely fashion.

E. Notify the District when ready to perform a re-inspection of the installation.

F. Provide 25-year manufacturer's warranty/certification documentation for all copper and fiber cable plant installations.

3.11 CLOSEOUT DOCUMENTS

A. See section 27 00 00 for requirements.

APPENDIX A – Pre-Approved Materials

DESCRIPTION	MFG	PART NUMBER
Telecommunications Rack, 4 Post 45RU	Panduit	AR4PCN
Concrete Floor Anchor Kit	Panduit	RFAKIT
Vertical Cable Manager	Panduit	PR2VFD06
Telecommunications Cabinet, 45U	Panduit	XG84522BS0005
Cable Management Fingers, 45U	Panduit	ZGLFMS45B
Wall Cabinet 26U, 30” Deep	Panduit	PZWMC2630W
Fan Kit for Wall Cabinet	Panduit	PZCFK
Ground Kit for Wall Cabinet	Panduit	PZWMCGK
Vertical Wall Cabinet 3RU/3RU	Panduit	WME3BL
Vertical Wall Cabinet 6RU/6RU	Panduit	WME6BL
Fan Kit for Vertical Wall Cabinet	Panduit	PZAEFAN
Ground Kit for Vertical Wall Cabinet	Panduit	WMEGK
Fiber Bracket for Vertical Wall Cabinet	Panduit	FWME1BL
19” Horizontal Cable Manager 1-RU	Panduit	NCMHF1
Patch Panel 24-port 1-RU (Black)	Panduit	CPPL24M6BLY
Patch Panel Cable Management Support Bar	Panduit	SRB19BLY
Faceplate, 2-port (Ivory)	Panduit	CFPL2EIY
Faceplate, 4-port (Ivory)	Panduit	CFPL4EIY
Surface Mount, 2-port (Ivory)	Panduit	CBX2EI-AY

Faceplate, 1-port w/ phone hanger and Cat6A data jack (blue)	**Panduit**	**KWPY with: NK6X88MBU**
Cat6A Cable, Plenum (Blue)	**Panduit**	**PUP6AHD04BU-G**
Cat6A Cable, In-door/Outdoor (Black)	**Panduit**	**PUO6AS04BL-G**
Cat6A Cable, Outdoor (Black)	**Panduit**	**PFO6X04BL-CEG**
Cat6A Data Jacks (Green)	**Panduit**	**CJ6X88TGGR**
Cat6A Data Jacks (Blue)	**Panduit**	**CJ6X88TGBU**
Cat6A Data Jacks (Purple)	**Panduit**	**CJ6X88TGVL**
Cat6A Data Jacks (Black)	**Panduit**	**CJ6X88TGBL**
Cat6A Data Jacks (Orange)	**Panduit**	**CJ6X88TGOR**
Cat6A Data Jacks (Red)	**Panduit**	**CJ6X88TGRD**
Cat6A Data Jacks Angled (Green)	**Panduit**	**CJUDCAPBU-GR**
Cat6A Data Jacks Angled (Blue)	**Panduit**	**CJUDCAPBU-BU**
Cat6A Data Jacks Angled (Purple)	**Panduit**	**CJUDCAPBU-VL**
Cat6A Data Jacks Angled (Black)	**Panduit**	**CJUDCAPBU-BL**
Cat6A Data Jacks Angled (Orange)	**Panduit**	**CJUDCAPBU-OR**
Cat6A Data Jacks Angled (Red)	**Panduit**	**CJUDCAPBU-RD**
Cat6A Patch Cord Slim (col-or to match jack)	**Panduit**	**UTP28X**
Fiber Optic LIU 1-RU	**Panduit**	**FRME1U**
Fiber Optic LIU 2-RU	**Panduit**	**FRME2U**
Fiber Adapter Panel (12 pair)	**Panduit**	**FAP12WBUDLCZ**
Fiber Adapter Panel Blank	**Panduit**	**FAPB**

Fiber Optic Cable Single-Mode OS2, Indoor/Outdoor 6-Strand	**Panduit**	**FSLP906**
Fiber Optic Cable Single-Mode OS2, Indoor/Outdoor 24-Strand	**Panduit**	**FSLP924**
Fiber Optic Patch Cord, OS2 LC/LC 1 meter	**Panduit**	**F92ERQ1Q1SNM001**

END OF SECTION

SECTION 27 21 00
DATA COMMUNICATIONS NETWORK EQUIPMENT

PART I - GENERAL

1.01 SUMMARY

A. This section specifies equipment, accessories, materials, installation, configuration, and testing requirements for a complete and operable data network system. The system shall provide reliable and high-performance data communication throughout the site.

1.02 SCOPE

A. The work will include but not be limited to the following objectives:

Provide, coordinate, and install all required equipment and accessories as outlined in the design documents for a complete and operable system.

Labor and Materials: The Contractor shall provide and pay for all labor, supervision, materials, accessories, components, equipment, tools, utilities, construction equipment and machinery, transportation, and other facilities and services necessary for the proper execution, operation, and completion of a turn-key system to the District.

Data Communications Network Equipment: Includes, but is not limited to:
Routers
Firewalls
Networking Switches
Wireless Access Points
VoIP Phone Equipment
Uninterruptible Power Supplies (UPS)

1.03 RELATED REQUIREMENTS

A. Division 01 - General Requirements

B. Section 27 00 00 - Communications

C. Section 27 05 00 - Common Work Results for Communication Systems.

D. Section 27 10 00 - Structured Cabling

1.04 QUALIFICATIONS

A. Contractor shall be located within 50 miles or less from the project site to support 2-hour response time.

B. Five years' experience installing data network equipment and systems.

1.05 SYSTEM REQUIREMENTS

A. Any new installations or existing system modifications shall seamlessly integrate into the site's existing data network infrastructure.

1.06 CONTRACTOR "SHOP DRAWINGS" DESIGN REQUIREMENTS

A. See section 27 00 00 for requirements.

B. Shop Drawings shall be required for this section.

1.07 SUBMITTALS

A. See section 27 00 00 for requirements.

B. Submittals shall be required for this section.

1.08 WARRANTY

A. Refer to Division 01 Warranty section.

B. See section 27 00 00 for additional requirements.

1.09 CLOSEOUT DOCUMENTS

A. See section 27 00 00 for requirements.

PART 2 - PRODUCTS

2.01 GENERAL

A. See Appendix A at the end of this document for pre-approved materials.

B. All products shall be new, unused and without blemishes and shall be of manufacturer's current and standard production.

C. Drawings and Specifications indicate major system components, and may not show every component, connector, module, or accessory that may be required to support the operation specified. Contractor shall provide all components needed for complete and satisfactory installation/operation.

D. Product Availability

1. Contractor, prior to submitting a proposal, shall determine product availability and delivery time, and shall include such considerations into his proposed Contract Time.

2. Subject to compliance with these specifications, products and systems included in this section are to be installed as specified by the manufacturer of the system or engineer approved equal.

2.02 EQUIPMENT

A. The District's preferred manufacturer for:
1. Routers - Aruba
2. Firewalls - Aruba
3. Networking Switches – Aruba
4. Wireless Access Points - Aruba
6. UPS – N1C

B. Substitutions require proof of equivalence and approval by District and/or its representative.

PART 3 - EXECUTION

3.01 ACCEPTABLE INSTALLERS

A. The equipment shall only be installed by Contractors who are qualified to install and maintain the system.

B. The Contractor (or subcontractor listed at time of bid) must have at least five (5) years' experience installing data network equipment before the Bid Opening Date.

3.02 EXAMINATION

A. The Contractor shall be required to visit the installation site(s) prior to bidding for the job. The Contractor acknowledges that the failure to visit the site(s) will not relieve the Contractor of the responsibility for observing and considering those conditions which a Contractor would have observed and considered during a site visit, estimating properly the difficulty

and cost of successfully performing the Work or proceeding to perform the Work without additional cost to District.

B. The Contractor shall report any discrepancies between the Specifications, Drawings, and Site Examination prior to the Bid Opening Date.

3.03 PREPARATION

A. The Contractor shall verify materials are readily available prior to submitting product submittals and notify the Project Manager of long lead time items.

B. The Contractor shall order all required parts and equipment only after receipt of approved product submittals from the Project Manager.

C. The Contractor shall coordinate with the District's Technology Services department for needed IP addresses at least 2 weeks prior to configuration/installation.

3.04 SHOP DRAWINGS

A. The Contractor shall create "Shop Drawings" per section 27 00 00.

3.05 WORKMANSHIP

A. Quality workmanship is a high priority for the District and the Contractor shall be held to a high-level of professional workmanship.

B. The District's Project or Construction Manager will have the authority to reject Work which does not conform to the Drawings and Specifications.

C. Comply with highest industry standards, except when specified requirements indicate more rigid standards or more precise workmanship.

D. Perform Work with persons experienced and qualified to produce workmanship specified.

E. Maintain quality control over suppliers and Subcontractors.

3.06 PATHWAY AND EQUIPMENT INSTALLATION

A. Install all conduit and pathway per design documents. Refer to 27 05 00 for additional information/requirements.

B. Install all Cat6A cable per design documents. Refer to 27 10 00 for additional information/requirements.

C. Equipment to be installed per manufacturer's instructions.

D. Devices requiring PoE power shall be connected to a PoE switch in the MDF/IDF data rack – verify with Technology Services for available PoE power.

3.07 CONFIGURATION

A. Any information needed from the District for configuration of equipment (i.e. VLAN, etc.) needs to be requested in writing 2 weeks prior.

B. All equipment to be fully configured and tested for functionality by the Contractor prior to District acceptance testing.

3.08 FIELD QUALITY CONTROL AND TESTING

A. Upon reaching substantial completion, perform a complete test and inspection of the system. If found to be installed and operating properly, notify the District of readiness to perform the formal Test & Inspection of the complete system by the District or its representative. Make all adjustments/changes required from District/representative review.

B. Submit the Record Drawings (as-builts) to District for review prior to inspection.

C. During the formal Test & Inspection (Commissioning) of the system and have personnel available with tools and equipment to inspect wiring, devices, and system operation.

D. If corrections are needed, the Contractor will be provided with a Punch-List of all discrepancies. Perform the needed corrections in a timely fashion.

E. Notify the District when ready to perform a re-inspection of the installation.

3.10 AS-BUILT DRAWINGS

A. See section 27 00 00 for requirements.

APPENDIX A – Pre-Approved Materials

DESCRIPTION	MFG	PART NUMBER
Network Switch (48G/4SFP+)	**Aruba**	**OFCI**
SFP+ Transceiver	**Aruba**	**OFCI**
Core Switch	**Aruba**	**OFCI**
Wireless Access Point (In-door, Ceiling)	**Aruba**	**OFCI**
Wireless Access Point (In-door, Ceiling, High Density)	**Aruba**	**OFCI**
Wireless Access Point (Out-door)	**Aruba**	**OFCI**
Mount for indoor Wireless Access Point (ceiling)	**Aruba**	**S0J40A**
Mount for indoor Wireless Access Point (right angle for beam/wall)	**Oberon**	**1006-ARAP635**
Mount for indoor Wireless Access Point / High Density (right angle for beam/wall)	**Oberon**	**1006-ARAP655**
Mount for outdoor Wire-less Access Point	**Aruba**	**R9H97A**
UPS (MDF and IDF)	**N1C**	**OFCI**
Vape Sensor **w/ Wire Guard**	**Halo** **American Time**	**3C** **G2025**

SECTION 27 51 23.50
EDUCATIONAL INTERCOM SYSTEMS

PART I - GENERAL

1.01 SUMMARY

A. This section specifies equipment, accessories, materials, wire, installation, configuration, and testing requirements for a complete and operable Intercom/Public Address/Bell system. This system shall provide the ability to bi-directionally communicate with an individual room, broadcast to defined speaker zone(s) and ring bell tones on a predefined schedule. For sites that utilize IP clock/speaker combination devices, this section will supplant the use of section 27 53 13 Clock Systems.

1.02 SCOPE

A. The work will include but not be limited to the following objectives:

1. Labor and Materials: The Contractor shall provide and pay for all labor, supervision, materials, accessories, components, equipment, tools, transportation, and other facilities and services necessary for the proper installation of a turn-key Educational Intercom system to the District.

2. The contractor will coordinate with the District in writing for any needed information (i.e. IP addresses, etc.) 10 business days prior to the date the information is needed.

B. The District has standardized on the Bogen Nyquist E7000 system. The installing Contractor shall be Bogen authorized.

C. Not used.

D. The Contractor shall be responsible for furnishing and installing all pathway, cabling, terminations, signal terminal cabinets, backboard, mounts, and backboxes.

E. The contractor shall be responsible for programming the Bogen Intercom System.

F. The contractor shall coordinate with site staff for bell schedule and programming requirements.

G. The contractor shall review the proposed final system programming, functionality, and expectations with the District Representative and Architect/Engineer/Designer prior to final programming.

H. After completion of the installation and pretest of the system a satisfactory final test of the entire system shall be made in the presence of the inspector of record (IOR) and District or the District's representative.

I. The Contractor shall adjust any analog (25V) speaker levels to the appropriate level as determined in system testing.

J. Existing systems shall remain operable until the new system is accepted and approved by the District or the District's representative.

K. The contractor is responsible for user/operator training (4 hours).

K. The Contractor shall complete all required project closeout documentation in a timely fashion.

1.03 RELATED REQUIREMENTS

A. Division 01 – General Requirements

B. Section 27 00 00 - Communications

C. Section 27 05 00 – Common Work Results for Communication Systems.

E. Section 27 10 00 – Structured Cabling

1.04 REFERENCES

A. See section 27 00 00 for requirements.

1.05 DEFINITIONS

A. See section 27 00 00 for requirements.

1.06 SYSTEM REQUIREMENTS

A. Any new installations or existing system modifications shall seamlessly integrate into the site's existing intercom system when applicable.

1.07 SUBMITTALS

A. See section 27 00 00 for requirements.
B. Submittals shall be required for this section.

1.08 CONTRACTOR "SHOP DRAWINGS" DESIGN REQUIREMENTS

A. See section 27 00 00 for requirements.
B. Shop drawings are required for this section.

1.09 QUALIFICATIONS

A. Contractor shall be located within 50 miles or less from the project site to support 2-hour response time.

B. Five (5) years' experience installing educational intercom equipment.

C. The contractor shall possess a California a C7 or C10 license.

D. The Contractor or Subcontractor shall be Bogen authorized to provide and install equipment with 5 years documented experience.

1.10 CERTIFICATIONS

A. Installers shall be manufacturer certified.

1.11 WORKMANSHIP

A. Quality workmanship is a high priority for the District and the Contractor shall be held to a high-level of professional workmanship.

B. The District's Project or Construction Manager will have the authority to reject Work which does not conform to the Drawings and Specifications.

C. Comply with highest industry standards, except when specified requirements indicate more rigid standards or more precise workmanship.

D. Perform Work with persons experienced and qualified to produce workmanship specified.

E. Maintain quality control over suppliers and Subcontractors.

F. Contractor shall be responsible for scheduling Subcontractors in a timely fashion.

1.12 WARRANTY

A. Refer to Division 01 Warranty section.

B. See section 27 00 00 for additional requirements.

1.13 CLOSEOUT DOCUMENTS

A. See section 27 00 00 for requirements.

PART 2 – PRODUCTS

2.01 GENERAL

A. The approved manufacturers for the project are:
1. Control unit and related accessories: Bogen
2. Speakers: See Appendix A for different installation types
3. Wire, cable, and accessories: See Appendix A.

B. All products shall be new, unused and without blemishes and shall be of manufacturer's current and standard production.

C. Drawings and Specifications indicate major system components, and may not show every component, connector, module, or accessory that may be required to support the operation specified. The Contractor shall provide all components needed for complete and satisfactory installation and operation.

D. Product Availability

1. The Contractor, prior to submitting a proposal, shall determine product availability and delivery time, and shall include such considerations into his proposed Contract Time.

2. Subject to compliance with these specifications, products and systems included in this section are to be installed as specified by the manufacturer of the system or engineer approved equal.

2.02 EQUIPMENT

A. See Appendix A at the end of this document for pre-approved materials.

B. Substitutions require proof of equivalence and prior approval by District and/or it's representative before ordering.

PART 3 - EXECUTION

3.01 ACCEPTABLE INSTALLERS

A. The equipment shall only be installed by Contractors who are qualified and certified by the manufacturer to install and maintain the system.

B. The Contractor (or subcontractor listed at time of bid) must have at least five (5) years' experience installing educational intercom equipment before the Bid Opening Date.

3.02 EXAMINATION

A. The Contractor shall be required to visit the installation site(s) prior to bidding the job. The Contractor acknowledges that the failure to visit the site(s) will not relieve the Contractor of the responsibility for observing and considering those conditions which a Contractor would have observed and considered during a site visit, estimating properly the difficulty and cost of successfully performing the Work or proceeding to perform the Work without additional cost to District.

B. The Contractor shall report any discrepancies between the Specifications, Drawings, and Site Examination prior to the Bid Opening Date.

3.03 PREPARATION

A. The Contractor shall verify materials are readily available prior to submitting product submittals and notify the District's Project Manager of long lead time items.

B. The Contractor shall order all required parts and equipment only after receipt of approved product submittals from the District's Project Manager.

C. Submit and receive approval for shop drawings prior to work commencement.

3.04 PATHWAY INSTALLATION

A. See Division 26 and Section 27 05 00 for requirements and more information.

B. Existing Construction:
   1. Refer to design documents.
   2. Surface raceway and components shall be Wiremold 2300.

3.05 EQUIPMENT INSTALLATION

A. Equipment to be wired and installed per manufacturer's instructions.

B. Installation shall be in accordance with applicable codes (i.e. NEC, NFPA 72) local and state codes, as shown on the drawings, and as recommended by the major equipment manufacturer.

C. Perform all Work as indicated in the Drawings and Specifications.

D. All low voltage cables shall be kept away from power circuits.

3.06 LABELING/SCHEDULES

A. All labels are to be machine generated black letters on white adhesive label stock that is appropriate for the installation environment (interior/exterior).

B. Label all analog speaker cables with port ID.

C. Label all analog speakers with speaker ID.

D. Label all IP speakers with MDF/IDF, patch panel and jack numbers.

3.09 CONFIGURATION

A. All equipment to be fully configured and tested for functionality prior to testing.
B. With two weeks advanced notice, contractor shall request IP addressing information via the District Representative
   a. All Nyquist devices will operate in a dedicated Vlan
   b. The Nyquist controller shall be assigned a static IP address
   c. All other equipment shall be set to DHCP
C. The contractor shall review the proposed final system programming, functionality, and expectations with the District Representative and Architect/Engineer/Designer two weeks prior to final programming.

3.10 FIELD QUALITY CONTROL AND TESTING

A. Upon reaching substantial completion, perform a complete test and inspection of the system. If found to be installed and operating properly, notify District of your readiness to perform the formal Test & Inspection of the complete system.

B. Submit the Record Drawings (as-builts) to District for review prior to inspection.

C. During the formal Test & Inspection (Commissioning) of the system the Contractor shall have personnel available with tools and equipment to inspect wiring, devices, and system operation.

D. If corrections are needed, the Contractor will be provided with a Punch-List of all discrepancies. Perform the needed corrections in a timely fashion.

E. Notify the District when ready to perform a re-inspection of the installation.

F. District or its representative to provide final sign-off for acceptance.

3.11 AS-BUILT DRAWINGS

A. See section 27 00 00 for requirements.

B. As-built drawings shall be required for this section.

APPENDIX A – Pre-Approved Materials

INTERCOM HEADEND:

DESCRIPTION	MANUFACTURER	PART NUMBER
System Controller	Bogen	Nyquist NQ-SYSCTRL
I/O Controller	Bogen	Nyquist NQ-E7010
Matrix Mixer Pre Amp	Bogen	Nyquist NQ-P0100
Admin telephone set	Bogen	Nyquist NQ-T1100
Zone Amplifier	Bogen	Nyquist NQ-A2060-G2

INTERCOM SYSTEM COMPONENTS:

DESCRIPTION	MANUFACTURER	PART NUMBER
Exterior speaker A. Speaker B. Back box C. Interior Box D. IP Module	 A. Lowell C. FSR D. Bogen	 A. VRG-LUH15TX B. CB84-SGBPO C. SMWB-4G-W D. NQ-GA10P
Classroom combo clock/speaker setup: A. Speaker/Clock Combo w/ surface backbox	 A. Bogen	 A. NQ-S1810WBC
Interior Speaker (IP wall mount) A. Speaker w/ surface backbox	A. Bogen	A. NQ-S1810WT-G3
2x2 Lay In Speaker w/ IP module A. Speaker B. IP Module	 A. Bogen B. Bogen	 A. CSD2X2U-V2 B. NQ-GA10P
2x2 Lay In Speaker (25V) A. Speaker	A. Bogen	A. CSD2X2U-V2

INTERCOM CABLING AND TERMINATION COMPONENTS:

DESCRIPTION	MANUFACTURER	PART NUMBER
Intercom speaker cable, 2-conductors., 22 AWG, solid, shielded 1-pair, interior (non-plenum)	WestPenn	292

END OF APPENDIX A

[END OF 27 51 23]

SECTION 28 20 00

VIDEO SURVEILLANCE

PART I - GENERAL

1.01 SUMMARY

A. This section specifies software, equipment, accessories, wire, materials, installation, configuration, and testing requirements for a complete and operable Video Surveillance system. The system shall provide electronic recording/playback and monitoring of digital cameras installed at the site.

1.02 SCOPE

A. The work will include but not be limited to the following objectives:
1. Labor and Materials: The Contractor shall provide and pay for all labor, supervision, materials, accessories, wire, components, equipment, tools, transportation, and other facilities and services necessary for the proper installation of a turn-key Video Surveillance system to District.

1.03 RELATED REQUIREMENTS

A. Division 01 - General Requirements

B. Section 27 00 00 - Communications

C. Section 27 05 00 - Common Work Results for Communication Systems.

C. Section 27 10 00 - Structured Cabling

1.04 QUALIFICATIONS

A. Contractor shall be located within 50 miles or less from the project site to support 2-hour response time.

B. Five years' experience installing Video Surveillance equipment systems.

1.05 SYSTEM REQUIREMENTS

A. Any new installations or existing system modifications shall seamlessly integrate into the site's existing Video Surveillance system.

1.06 CONTRACTOR “SHOP DRAWINGS” DESIGN REQUIREMENTS

A. See section 27 00 00 for requirements.

B. Shop drawings are required for this section.

1.07 SUBMITTALS

A. See section 27 00 00 for requirements.

B. Submittals are required for this section.

1.08 WARRANTY

A. Refer to Division 01 Warranty section.

B. See section 27 00 00 for additional requirements.

1.09 CLOSEOUT DOCUMENTS

A. See section 27 00 00 for requirements.

PART 2 - PRODUCTS

2.01 GENERAL

A. See Appendix A at the end of this document for pre-approved materials.

B. All products shall be new, unused and without blemishes and shall be of manufacturer's current and standard production.

C. Drawings and Specifications indicate major system components, and may not show every component, connector, module, or accessory that may be required to support the operation specified. Contractor shall provide all components needed for complete and satisfactory installation/operation.

D. Product Availability

1. Contractor, prior to submitting a proposal, shall determine product availability and delivery time, and shall include such considerations into his proposed Contract Time.

2. Subject to compliance with these specifications, products and systems included in this section are to be installed as specified by the manufacturer of the system or engineer approved equal.

2.02 EQUIPMENT

A. The District’s preferred manufacturer for CCTV equipment is Axis.

B. The District’s preferred manufacturer for video intercom is Aiphone.

C. Substitutions require proof of equivalence and approval by District and/or its representative.

D. All exterior cameras to be IP67 rated or better.

PART 3 - EXECUTION

3.01 ACCEPTABLE INSTALLERS

A. The equipment shall only be installed by Contractors who are qualified to install and maintain the system.

B. The Contractor (or subcontractor listed at time of bid) must have at least five (5) years' experience installing Video Surveillance equipment before the Bid Opening Date.

3.02 EXAMINATION

A. The Contractor shall be required to visit the installation site(s) prior to job bidding. The Contractor acknowledges that the failure to visit the site(s) will not relieve the Contractor of the responsibility for observing and considering those conditions which a Contractor would have observed and considered during a site visit, estimating properly the difficulty and cost of successfully performing the Work or proceeding to perform the Work without additional cost to District.

B. The Contractor shall report any discrepancies between the Specifications, Drawings, and Site Examination prior to the Bid Opening Date.

3.03 PREPARATION

A. The Contractor shall verify materials are readily available prior to submitting product submittals and notify the Project Manager of long lead time items.

B. The Contractor shall order all required parts and equipment only after receipt of approved product submittals from the Project Manager.

C. The Contractor shall coordinate with the District's Technology Services department for needed IP addresses at least 2 weeks prior to configuration/installation.

3.04 SHOP DRAWINGS

A. The Contractor shall create "Shop Drawings" per section 27 00 00.

3.05 WORKMANSHIP

A. Quality workmanship is a high priority for the District and the Contractor shall be held to a high-level of professional workmanship.

B. The District's Project or Construction Manager will have the authority to reject Work which does not conform to the Drawings and Specifications.

C. Comply with highest industry standards, except when specified requirements indicate more rigid standards or more precise workmanship.

D. Perform Work with persons experienced and qualified to produce workmanship specified.

E. Maintain quality control over suppliers and Subcontractors.

3.06 PATHWAY AND EQUIPMENT INSTALLATION

A. Install all conduit and pathway per design documents. Refer to 27 05 00 for additional information/requirements.

B. Install all Cat6A cables per design documents. Refer to Section 27 10 00 for additional information/requirements.

B. Equipment to be installed per manufacturer's instructions.

C. Devices requiring PoE power shall be connected to a PoE switch in the MDF/IDF data rack – verify for adequate PoE power capacity.

3.07 CONFIGURATION

A. Program cameras and/or NVR with network IP address using information provided by the District's Technology Services department.

B. All equipment to be fully configured and tested for functionality prior to District acceptance testing.

3.08 CAMERA VIEW

A. Adjust view aim, zoom, and focus camera to show intended view from design documents. Contractor to coordinate with District for final acceptance of camera views.

3.09 FIELD QUALITY CONTROL AND TESTING

A. Upon completion of network programming and initial view setting, notify District of your readiness to perform the formal camera view review with District or its representative. Make all adjustments required from District review.

B. Submit the Record Drawings (as-builts) to District for review prior to inspection.

C. During the formal Test & Inspection (Commissioning) of the system, Contractor to have personnel available with tools and equipment to inspect wiring, devices, and system operation.

D. If corrections are needed, the Contractor will be provided with a Punch-List of all discrepancies. Perform the needed corrections in a timely fashion.

E. Notify the District when ready to perform a re-inspection of the installation.

3.10 AS-BUILT DRAWINGS

A. See section 27 00 00 for requirements.

APPENDIX A – Pre-Approved Materials

DESCRIPTION	MFG	PART NUMBER
Multidirectional Network Camera (4x2MP)	**Axis**	**OFCI**
Panoramic Network Camera (2x5MP)	**Axis**	**OFCI**
Dome Network Camera, Outdoor (5MP)	**Axis**	**OFCI**
Pendant Kit for Multidirectional Camera	**Axis**	**T94N01D**
Wall Mount for Multidirectional Camera	**Axis**	**T91H61**
Corner Bracket for Multidirectional Network Camera	**Axis**	**T91A64**
Pole Mount for Multidirectional Network Camera	**Axis**	**T91B67**
Conduit Adapter 3/4" for Panoram-ic Network Camera	**Axis**	**5505-541**

SECTION 31 23 16.13 - TRENCHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes excavating trenches for utilities from outside building to final connection point or public right-of-way or utility; compacted fill from top of utility bedding to subgrade elevations; and backfilling and compaction.

B. Related Sections:
   1. Section 31 23 00 - Excavation and Fill.
   2. Section 31 23 23.13 - Backfill.

1.2 REFERENCES

A. The project Soils Report and any supplements to the Soils Report.

1.3 DEFINITIONS

A. Utility: Any buried pipe, duct, conduit, or cable.

1.4 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.5 COORDINATION

A. Section 01 06 00 - Regulatory Requirements.

B. Verify Work associated with lower elevation utilities is complete before placing higher elevation utilities.

C. Verify elevations of existing facilities prior to placing new Work.

PART 2 - PRODUCTS

2.1 FILL MATERIALS

A. Fill and Structural Fill shall be: As specified in the project Soils Report and any supplements to the Soils Report.

2.2 ACCESSORIES

A. Filter Fabric: Non-biodegradable, woven as manufactured by TC Mirafi, Tenax Corp., Tensar Earth Technologies, Inc. or equal.

PART 3 - EXECUTION

3.1 LINES AND GRADES

A. Grades
1. Pipes shall be laid true to the lines and grades indicated.
2. The grade alignment of the pipe shall be maintained by the use of a string line parallel with the grade line and vertically above the centerline of the pipe. This line shall be established on level batter boards at intervals of not more than 25 feet. Batter boards shall span the trench and be rigidly anchored to substantial posts driven into the ground on each side of the trench. Three adjacent batter boards must be set before laying pipe to provide a check on the grades and line. Elevation and position of the string line shall be determined from the elevation and position of offset points or stakes located along the pipe route. Pipe shall not be laid using side lines for line or grade.
3. As an alternative means of establishing alignment and grade, a "Laser-Beam" instrument may be utilized with a competent operator.

B. Location of Pipe Lines:
1. The location and approximate depths of the proposed pipe lines are shown on the Drawings.
2. An underground locate service shall be enlisted to discover the location of existing utilities regardless if they are shown on the drawings.
3. The Architect/Engineer reserves the right to make changes in lines, grades, and depths of pipe lines and manholes when such changes are necessary.

3.2 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

B. Protect plant life, lawns, and other features remaining as a portion of final landscaping.

C. Protect bench marks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

D. Maintain and protect above and below grade utilities which are to remain.

E. Cut out soft areas of subgrade not capable of compaction in place. Backfill and compact to density equal to or greater than requirements for subsequent backfill material.

3.3 EXCAVATING

A. Excavate subsoil required for utilities.

B. Cut trenches sufficiently wide to enable installation and allow inspection. Remove water or materials that interfere with Work.

C. Do not interfere with 45 degree bearing splay of foundations.

D. Hand trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.

E. Remove lumped subsoil, boulders, and rock as directed by the Soils Engineer or other inspector.

F. Correct over excavated areas with backfill and compact replacement as specified for authorized excavation.

G. Stockpile excavated material on site. Remove excess material not being used from site.

3.4 TRENCHING

A. Excavations:
1. Excavation shall be dug so that the pipe can be laid and jointed properly. The trench shall be made so that the pipe can be laid to the alignment and depth as shown on the Drawings, and it shall be excavated only so far in advance of pipe laying as permitted by the Architect/Engineer. The excavation shall not be more than two feet wider at the bottom than the outside diameter of the pipe or structure. If there is no interference with construction, or adjacent property, and if soil permits, the Contractor at his own expense shall be permitted to slope the side walls of the excavation starting at a point two (2) feet above the top of pipe.
2. The trench shall be excavated to the depth required so as to provide a uniform and continuous bearing and support for the pipe on bedding material at every

point between joints, except where pipe slings or other lifting tackle are withdrawn.

3. Excavation Below Grade:
    1) Where excavation indicates that the subsurface materials at the bottom of the trench are in a loose or soft state, the Contractor shall be advised to excavate to a depth where suitable material is encountered, as directed by the Architect/Engineer.
    2) Where the bottom of the trench has been excavated by mistake to a greater depth than required, the Contractor shall refill this area using approved material. No additional compensation shall be given to the Contractor. Refilling with earth to bring the bottom of the trench to the proper grade will not be permitted.
4. Excavation within 24 inches of existing utilities shall be governed by specifications of the Owner of the respective utility. The Contractor shall obtain these specifications and follow the same at no extra cost.
5. Excavation and shoring shall adhere to the requirements and safety standards set by OSHA.

B. Trenching in Advance of Pipe Laying: The trench for the pipe lines shall not be opened for a distance of more than 200 feet at any one time, unless authorized by the Architect/Engineer. At no time will the Contractor be permitted to leave more than 50 feet of trench open at the end of a working day. Adequate protection of open trench shall be provided by the Contractor and the Contractor shall be responsible therefore.

3.5 SHEETING AND BRACING

A. General:
1. Sheeting and bracing of all excavations shall conform to the latest statutes of the State of California governing safety of workers in the construction industry. When necessary, in the opinion of the Contractor, adequate sheeting and bracing shall be installed to prevent ground movement that may cause damage or settlement to adjacent structures, pipelines and utilities. Any damage due to settlement because of failure to use sheeting or because of inadequate bracing, or through negligence or fault of the Contractor in any other manner, shall be repaired at the Contractor's expense.
2. Sides of trenches in unsuitable, loose or soft material, five feet or more in depth, shall be shored, sheeted, braced, sloped, or otherwise supported by means of sufficient strength to protect employees working within them.

B. Sheeting Requirements:
1. Where excavations are made with vertical sides which require supporting, the sheeting and bracing shall be of sufficient strength to sustain the sides of the excavations and to prevent movement which could in any way injure the Work,

or adjacent structures, or diminish the working space sufficiently to delay the Work. Special precautions shall be taken where there is additional pressure due to the presence of other structures.

2. It shall be the Contractor's responsibility to select sheeting and bracing of sufficient dimensions and strength and type to adequately support the sides of trenches and excavations.
3. Sheeting and bracing shall be removed before the completion of the Work.

3.6 BACKFILLING

A. Backfill trenches to contours and elevations shown on the drawings.

B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.

C. Fill materials shall be as specified in the Soils Report and any supplements to the Soils Report.

D. Employ a placement method that does not disturb or damage utilities in trench. Jetting of backfill materials to achieve compaction shall not be permitted.

E. Maintain optimum moisture content of fill materials to attain required compaction density.

F. Remove surplus fill materials from site.

3.7 TOLERANCES

A. Section 01 40 00 - Quality Requirements.

B. Top Surface of Backfilling Under Paved Areas: Plus or minus 0.05 feet from required elevations.

C. Top Surface of General Backfilling: Plus or minus 1/10 feet from required elevations.

3.8 FIELD QUALITY CONTROL

A. Compaction testing will be performed by the project Soils Engineer.

B. If tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.

3.9 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements.

B. Reshape and re-compact fills subjected to vehicular traffic during construction.

END OF SECTION 31 23 16 13

SECTION 31 23 23.13 - BACKFILL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes building perimeter and site structure, filling and backfilling to subgrade elevations; fill under slabs-on-grade, paving; fill for over-excavation; consolidation and compaction as specified in the Soils Report and any supplements to the Soils Report.

B. Related Sections:
   1. Section 31 23 00 - Excavation and Fill.
   2. Section 31 23 16.13 - Trenching.

1.2 REFERENCES

A. The project Soils Report and any supplements to the Soils Report.

PART 2 - PRODUCTS

1.3 FILL MATERIALS

A. Fill and Structural Fill as specified in the Soils Report and any supplements to the Soils Report.

1.4 ACCESSORIES

A. Geotextile Fabric: Non-biodegradable, woven as manufactured by TC Mirafi, Tensar Earth Technologies, Inc. or equal.

PART 2 - EXECUTION

1.5 EXAMINATION

A. Coordination and project conditions.

B. Verify subdrainage, dampproofing, or waterproofing installation has been inspected.

C. Verify structural ability of unsupported walls to support loads imposed by the fill.

1.6 PREPARATION

A. Compact subgrade to density requirements for subsequent backfill materials.

B. Cut out soft areas of subgrade not capable of compaction in place. Backfill and compact to density equal to or greater than requirements for subsequent fill material.

C. Roll subgrade surface to identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.

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1.7 BACKFILLING

A. Backfill areas to contours and elevations shown on drawings.

B. Employ a placement method that does not disturb or damage other work.

C. Maintain optimum moisture content of backfill materials to attain required compaction density.

D. Backfill against supported walls and structures. Do not backfill against unsupported walls or structures.

E. Backfill simultaneously on each side of unsupported walls and structures until supports are in place.

F. Slope grade away from building at a minimum slope of two (2%) percent, unless noted otherwise.

G. Make gradual grade changes. Blend slope into level areas.

H. Remove surplus backfill materials from site.

1.8 TOLERANCES

A. Section 01 40 00 - Quality Requirements.

B. Top Surface of Backfilling Under Paved Areas: Plus or minus 0.05 feet from required

elevations.

C. Top Surface of General Backfilling: Plus or minus 1/10 feet from required elevations.

1.9 FIELD QUALITY CONTROL

A. The project Soils Engineer shall provide testing and inspection services.

1.10 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements.

B. Reshape and re-compact fills subjected to vehicular traffic.

END OF SECTION 31 23 23.13

SECTION 32 12 16 - ASPHALT PAVEMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes asphaltic concrete paving, wearing, binder and base course; surface sealer; and aggregate base course.

B. Related Sections:
1. Section 31 05 13 - Soils for Earthwork.
2. Section 31 22 13 - Rough Grading: Preparation of site for paving and base.
3. Section 31 23 23.13 - Backfill: Compacted subbase for paving.
4. Section 32 11 23 - Aggregate Base Course.
5. Section 33 49 13 - Storm Drainage Manholes, Frames, and Covers.

1.2 REFERENCES

A. ASTM D946 - Penetration-Graded Asphalt Cement for Use in Pavement Construction.

B. ASTM D3381 - Viscosity Graded Asphalt Cement for Use in Pavement Construction.

C. TAI - (The Asphalt Institute) - MS-2 Mix Design Methods for Asphalt Concrete and Other Hot Mix Types.

D. TAI - (The Asphalt Institute) - MS-3 Asphalt Plant Manual.

E. TAI - (The Asphalt Institute) - MS-8 Asphalt Paving Manual.

F. TAI - (The Asphalt Institute) - MS-19 Basic Asphalt Emulsion Manual.

G. Caltrans Standard Specifications, 2010 Edition, Section 39.

1.3 SUBMITTALS

A. Product Data: Submit product information and mix design.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with Caltrans Standard Specifications.

B. Mixing Plant: Conform to Caltrans Standard Specifications.

C. Obtain materials from same source throughout.

D. Maintain one copy of each document on site.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Section 01 63 10 - Product Requirements.

B. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Asphalt Pavement: In accordance with Caltrans Standard Specifications.

2.2 SOURCE QUALITY CONTROL AND TESTS

A. Section 01 40 00 - Quality Control: Testing and Inspection Services: Provide mix design for asphalt.

B. Submit proposed mix design for review prior to beginning of Work.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 06 00 - Administrative Requirements: Coordination and project conditions.

B. Verify compacted granular base is dry and ready to support paving and imposed loads.

C. Verify gradients and elevations of base are correct.

3.2 SUBBASE

A. Section 32 11 23 - Aggregate Base Course forms the base construction for Work of this section.

3.3 PREPARATION - PRIMER

A. Apply primer in accordance with Caltrans Standard Specifications.

3.4 PREPARATION - TACK COAT

A. Apply tack coat in accordance with Caltrans Standard Specifications.

B. Apply tack coat to contact surfaces of curbs and gutters.

C. Coat surfaces of manhole and catch basin frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.

3.5 PLACING ASPHALT PAVEMENT - SINGLE COURSE

A. Install Work in accordance with Caltrans Standard Specifications.

3.6 PLACING FOG SEAL

3.7 CURBS

A. Install extruded asphalt curbs of profile as indicated on drawings.

3.8 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Flatness: Maximum variation of 1/4 inch measured with 10-foot straight edge.

C. Scheduled Compacted Thickness: Within 1/4 inch.

D. Variation from True Elevation: Within 1/2 inch.

3.9 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing and inspection services
Section 01 70 00 - Execution and Closeout Requirements: Testing, adjusting, and balancing.

3.10 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished work.

B. Immediately after placement, protect pavement from mechanical injury for 24 hours or until surface temperature is less than 140 degrees F.

3.11 SCHEDULES

A. Pavement sections for various locations and uses are to be as shown on the drawings.

END OF SECTION 32 12 16

SECTION 32 13 13 - CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes concrete sidewalks, integral curbs, gutters, parking areas, driveways, and roads, and aggregate base course.

B. Related Sections:
   1. Section 31 22 13 - Rough Grading.
   2. Section 31 23 23.13 - Backfill.

1.2 REFERENCES

A. ACI 304 (American Concrete Institute) - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.

B. ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.

C. ASTM A497 - Welded Deformed Steel Wire Fabric for Concrete Reinforcement.

D. ASTM A615 - DeformeM and Plain Billet-Steel for Concrete Reinforcement.

E. ASTM C33 - Concrete Aggregates.

F. ASTM C94 - Ready Mix Concrete.

G. ASTM C150 - Portland Cement

H. ASTM C260 - Air-Entraining Admixtures for Concrete.

I. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

J. ASTM C494 - Chemical Admixtures for Concrete.

K. ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.

L. ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with requirements of Local Municipality.

B. Maintain one copy of each document on site.

C. Obtain cementitious materials from same source throughout.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements.

B. Do not place concrete when base surface temperature is less than 40 degrees, or surface is wet or frozen.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

A. Wood or Steel form material, profiled to suit conditions.

B. Joint Filler: ASTM D1751.

2.2 REINFORCEMENT

A. Reinforcing Steel: ASTM A615; Grade 60 deformed billet steel bars; unfinished.

B. Welded Steel Wire Fabric: Plain type, ASTM A185 in flat sheets or coiled rolls; unfinished.

C. Dowels: ASTM A615; plain steel, unfinished.

2.3 CONCRETE MATERIALS

A. Concrete Materials: As specified in Section 03 30 00. Provide in accordance with local municipality Public Work's standards.

B. Fly Ash content per local Municipality Public Work's Standards.

2.4 CONCRETE MIX - BY PERFORMANCE CRITERIA

A. Provide concrete to the following criteria:
1. Compressive Strength: 3000 psi @ 28 days.

PART3 - EXECUTION

3.1 EXAMINATION

A. Coordination and project conditions.

B. Verify compacted subgrade or granular base is acceptable and ready to support paving and imposed loads.

C. Verify gradients and elevations of base are correct.

3.2 SUBBASE

A. Section 32 11 23 - Aggregate Base Course forms the base construction for Work of this section.

3.3 PREPARATION

A. Moisten base to minimize absorption of water from fresh concrete.

B. Coat surfaces of manhole and catch basin frames with oil to prevent bond with concrete pavement.

C. Notify Architect/Engineer minimum 24 hours prior to commencement of concreting operations.

3.4 FORMING

A. Place and secure forms to correct location, dimension, profile, and gradient.

B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.5 REINFORCEMENT

A. Place reinforcement as indicated on drawings.

B. Interrupt reinforcement at expansion joints.

C. Place reinforcement to achieve pavement and curb alignment as detailed.

3.6 PLACING CONCRETE

A. Place concrete in accordance with local municipality Public Work's standards.

B. Ensure reinforcement, inserts, embedded parts, formed joints and are not disturbed during concrete placement.

C. Place concrete continuously over the full width of the panel and between predetermined construction joints.

D. Place concrete to pattern indicated on drawings.

3.7 JOINTS

A. Place expansion and contraction joints as shown on drawings. Align curb, gutter, and sidewalk joints.

B. Place joint filler between paving components and building or other appurtenances. Recess top of filler 1/4 inch for sealant placement.

C. Provide scored sawn joints as indicated on drawings and between sidewalks and curbs.

3.8 EXPOSED AGGREGATE

A. See Landscape Drawings and Specifications.

3.9 FINISHING

A. Sidewalk Paving: Light broom perpendicular to path of travel and trowel joint edges.

B. Curbs and Gutters: Light broom in direction of flow.

C. Direction of Texturing: Transverse to pavement direction.

D. Inclined Vehicular Ramps: Broomed perpendicular to slope.

E. Place curing compound on exposed concrete surfaces immediately after finishing.

3.10 JOINT SEALING

A. Separate pavement from vertical surfaces with thick joint filler.

B. Place joint filler in pavement pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

C. Extend joint filler from bottom of pavement to within 1/8 inch of finished surface. Conform to joint sealer manufacturer requirements.

3.11 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation of Surface Flatness: 1/4 inch in 10 feet.

C. Maximum Variation From True Position: 1/2 inch.

3.12 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing and inspection services
Section 01 70 00 - Execution and Closeout Requirements: Testing, adjusting, and balancing.

B. Testing firm will take cylinders and perform slump [and air entrainment] tests in accordance with ACI 301.

C. One slump test will be taken for each set of test cylinders taken.

D. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.13 PROTECTION

A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

B. Do not permit pedestrian or vehicular traffic over pavement for 7days minimum after

finishing.

END OF SECTION 32 13 13