Technical Specifications For:

OFFICE IMPROVEMENTS

Descanso Elementary School

Client:
Mountain Empire Unified School District
3291 Buckman Springs Road
Pine Valley, CA 91962

Architect:
AlphaStudio Design Group
6152 Innovation Way
Carlsbad, CA 92009
760-431-2444

Electrical:
Johnson Consulting Engineers
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OFFICE IMPROVEMENTS

Descanso Elementary School

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Electrical Engineer:
Monica Goese-Hansen

Approved By:

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SECTION 01 1000
SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: Office Improvements - Descanso Elementary School.

B. Owner's Name: Mountain Empire Unified School District.

C. Architect's Name: AlphaStudio Design Group.

D. The Project consists of the remodel of an existing classroom into administration offices along with entry ramp and stair improvements.
   1. As shown in Contract Documents prepared by AlphaStudio Design Group; 6152 Innovation Way, Carlsbad, CA 92009; (760) 431-2444.

1.02 DEFINITIONS

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

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

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

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

E. Provide: To furnish and install products.

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

1.03 REGULATORY REQUIREMENTS

A. The following regulations are applicable to this project:
   1. 2022 California Building Code, Title 24, Part 2, California Code of Regulations (C.C.R.).
   2. 2022 California Electrical Code, Title 24, Part 3, California Code of Regulations (C.C.R.).
   3. 2022 California Mechanical Code, Title 24, Part 4, California Code of Regulations (C.C.R.).
   4. 2022 California Plumbing Code, Title 24, Part 5, California Code of Regulations (C.C.R.).
   5. 2022 California Fire Code, Title 24, Part 9, California Code of Regulations (C.C.R.).

B. Submit copies of all permits, licenses, and similar permissions obtained, and receipts for fees paid, to the owner directly.

1.04 CONTRACT DESCRIPTION

A. The work consists of the following:
   1. The scope of this project includes the conversion of a classroom into the campus administration front office. The design consists of interior improvements, including non-bearing partitions, doors, finishes, casework, ceiling modifications, electrical power, low voltage, fire alarm, door access control, and HVAC distribution modifications. In addition to the interior improvements, sitework will include the replacement of the accessible pedestrian ramp at the building entrance.

1.05 OWNER OCCUPANCY

A. Owner intends to occupy the Project upon Substantial Completion.

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

C. Schedule the Work to accommodate Owner occupancy.

1.06 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.

B. Arrange use of site and premises to allow:
   1. Owner occupancy.

2. Work by Others.
3. Work by Owner.

C. Provide access to and from site as required by law and by Owner:
   1. Do not obstruct roadways, sidewalks, or other public ways without permit.

D. Utility Outages and Shutdown:
   1. Limit disruption of utility services to hours the site is unoccupied.
   2. Prevent accidental disruption of utility services to other facilities.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 1141
PROJECT COORDINATION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:
   1. Coordination.
   2. Administrative and supervisory personnel.
   3. General installation provisions.
   4. Cleaning and protection.

1.03 COORDINATION

A. Coordinate all aspects of the Work so each portion is installed in proper relationship with the whole, so the Work progresses in the proper order, in a smooth manner, and without interference between the trades.

B. Observation of Work by others shall not be interpreted as relieving the Contractor from responsibility for coordination of all Work, superintendence of the Work, or scheduling and direction of the Work.

C. Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.
   1. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
   2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
   3. Make adequate provisions to accommodate items scheduled for later installation.

D. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
   1. Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.

E. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of schedules.
   2. Installation and removal of temporary facilities.
   3. Delivery and processing of submittals.
   4. Progress Meetings.
   5. Project Closeout activities.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.01 GENERAL INSTALLATION PROVISIONS

A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.

C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.

D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.

E. Visual Effects; Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.

F. Recheck measurements and dimensions, before starting each installation.

G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

I. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.

3.02 STARTING EQUIPMENT AND SYSTEMS

A. Provide manufacturer's field representative to prepare and start systems.

B. Adjust for proper operation within manufacturer's published tolerances.

C. Demonstrate proper operation of equipment to Owner's designated representative.

3.03 CLEANING AND PROTECTION

A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

C. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

END OF SECTION

SECTION 01 2000
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Sum and Contract Time.

C. Contract Change procedures.

D. Correlation of Contractor submittals based on changes.

E. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, Special Conditions, and other Sections in Division 1 of these Specifications.

B. The Contract Sum and the schedule for payments are described in other Documents of the Contract.

1.03 SCHEDULE OF VALUES

A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.

B. Forms filled out by hand will not be accepted.

C. Submit a printed schedule on AIA Form G703 - Application and Certificate for Payment Continuation Sheet. Contractor's standard form or electronic media printout will be considered.

D. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.

E. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section. Identify site mobilization.

F. Include separately from each line item, a direct proportional amount of Contractor's overhead and profit.

G. Revise schedule to list approved Change Orders, with each Application For Payment.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

C. Forms filled out by hand will not be accepted.

D. Present required information two on electronic media printout.

E. Form: AIA G702 Application and Certificate for Payment and AIA G703 - Continuation Sheet including continuation sheets when required.

F. For each item, provide a column for listing each of the following:
   1. Item Number.
   2. Description of work.
   3. Scheduled Values.
   4. Previous Applications.
   5. Work in Place and Stored Materials under this Application.
   6. Authorized Change Orders.
   7. Total Completed and Stored to Date of Application.
   8. Percentage of Completion.
   9. Balance to Finish.
   10. Retainage.

G. Execute certification by signature of authorized officer.

H. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.

I. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.

J. Submit three copies of each Application for Payment.

K. Include the following with the application:
   1. Transmittal letter as specified for Submittals in Section 01 3000.
   2. Construction progress schedule, revised and current as specified in Section 01 3000.
   3. All items listed and required under Article 37 of the General Conditions.

L. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

M. PROCESSING:
   1. The Contractor shall submit a proposed Schedule of Values along with a draft Application for Payment to the Architect and Project Inspector for review, comment and approval prior to submitting the first Application for Payment.
   2. When preparing the Application for Payment each month, the Contractor shall review the proposed percentages of completion of work being applied for with the Project Inspector, who shall approve of the percentages prior to formalizing the Application for Payment. If possible, the percentages should be reviewed with the District, Architect and Project Inspector at the closest scheduled job meeting prior to finalizing.
   3. The Contractor shall submit three (3) copies of the Applications for Payment, with original signatures to the Project Inspector, who will verify the percentages and sign all copies. The Contractor shall be responsible for delivery to the Architect for signatures.
   4. The Architect will review the Application for Payment, and the Architect of Record will sign all copies and forward it to the Contractor, who in turn shall be responsible for delivery to the District for signatures, processing and payment.
   5. Applications for Payment shall be made on a monthly basis and shall be filed by the Contractor to the District in the timeframe as set forth in the General Conditions. Signatures on the Application for Payment shall include the Contractor, Architect, and Project Inspector. The Contractor shall be responsible for obtaining all required signatures. Once all signatures are obtained, Application for Payment may be submitted to the District. Work for payment may be estimated or pro-rated to the end of the month if approved before hand by the District.
   6. Applications for Payment may include billing for project materials not on-site if these materials have been received and are being stored in a bonded warehouse. Receipts for such project materials must accompany the Application for Payment.
   7. Applications for Payment will not be processed if As-Built Drawings are not updated to the satisfaction of the Project Inspector and the Architect.

1.05 MODIFICATION PROCEDURES

A. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in Contractor's employ or subcontractors of changes to the Contract Documents.

B. For minor changes not involving an adjustment to the Contract Price or Contract Time, Architect will issue instructions directly to Contractor.

C. Architect's Supplemental Instructions (ASI): Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by the Conditions of the Contract by issuing supplemental instructions on Architect's Supplemental Instructions (A.S.I.).

D. Construction Change Directive (CCD): Architect may issue a document, signed by District, instructing Contractor to proceed with a change in the Work, for subsequent inclusion in a

Change Order.

1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
2. Promptly execute the change.

E. Proposal Request (P.R.): Architect may issue a document which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 5 days.
   1. PROPOSAL REQUEST PRICING:
      a. The Contractor responds to a Proposal Request using the Proposal Request Pricing area on the Proposal Request form, a copy of which is found at the end of this section. The Contractor completes this form providing an itemized cost breakdown and indicating any extensions of time required. Upon review and acceptance of the cost submitted, and when signed by the Owner and Architect and received by the Contractor, this document becomes effective IMMEDIATELY and the Contractor shall proceed with the approved changes. Proceeding with the changes constitutes acceptance of the cost and time adjustment indicated.

F. Proposed Contract Modifications (PCM): Contractor may propose a change by submitting a request for change or Proposed Contract Modification (P.C.M.) to the Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 6000.
   1. PROPOSED CONTRACT MODIFICATIONS (P.C.M.'s):
      a. If additional services are required in the opinion of the Contractor that a Proposal Request has not been issued for, the Contractor issues the Proposed Contract Modification form, a copy of which is found at the end of this section. The Contractor completes this form providing an itemized cost breakdown and any pertinent backup information deemed necessary to fully justify the cost submitted, and indicating any extensions of time required. Upon review and acceptance of the cost submitted, and when signed by the District and Architect and received by the Contractor, this document becomes effective IMMEDIATELY and the Contractor shall proceed with the approved changes. Proceeding with the changes constitutes acceptance of the cost and time adjustment indicated.
   2. P.R. / P.C.M. REPLY:
      a. If the Architect takes exception to any portion of the Proposal Request Pricing and/or Proposed Contract Modification submitted by the Contractor, the Architect shall reply in writing using the the P.R./P.C.M. Reply form. The Contractor shall resubmit a revised P.R. or P.C.M. (utilizing the same number but with a letter suffix, i.e. "P.C.M. #1A") in response to the comments made by the Architect.
      b. Should the dollar amount of additional costs or credits attributable to the P.R. and/or P.C.M. become a point of contention, the Contractor and the Architect shall each make a reasonable effort to arrive at a mutually agreed upon dollar amount. If an agreement cannot be reached within a reasonable time frame, dollar amounts will be based on the current edition of SAYLOR PUBLICATIONS, INC. CURRENT CONSTRUCTION COSTS. Other cost estimating books or reference materials may be used for determining dollar amounts if acceptable to the General Contractor, Architect and the Owner.

G. Execution of Change Orders: All approved P.R.'s and P.C.M.'s shall be processed as Change Orders. Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract. All Change Orders must be approved by the School Districts Governing Board and D.S.A.

H. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.

1. Refer to Article 40 of General Conditions.

I. Substantiation of Costs: Provide full information required for evaluation.
   1. On request, provide the following data:
      a. Quantities of products, labor, and equipment.
      b. Taxes, insurance, and bonds.
      c. Overhead and profit.
      d. Justification for any change in Contract Time.
      e. Credit for deletions from Contract, similarly documented.
   2. Support each claim for additional costs with additional information:
      a. Origin and date of claim.
      b. Dates and times work was performed, and by whom.
      c. Time records and wage rates paid.
      d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
   3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

J. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

K. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

L. Promptly enter changes in Project Record Documents.

1.06 APPLICATION FOR FINAL PAYMENT

A. As specified in the Agreement and Conditions of the Contract.
   1. Refer to Article 37 of the General Conditions.

B. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

C. Application for Final Payment will not be considered until the following have been accomplished:
   1. All requirements of Article 37 of the General Conditions.
   2. DSA Form 6-C Contractor Verified Report filed with the Division of the State Architect.
   3. All closeout procedures specified in Section 01780.

END OF SECTION

SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preconstruction meeting.

B. Progress meetings.

C. Construction progress schedule.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Stages of the Work, Work covered by each contract, occupancy, .

B. Section 01 3010 - Submittals: Submittal procedures.

C. Section 01 7000 - Execution and Closeout Requirements: Additional coordination requirements.

D. Section 01 7800 - Closeout Submittals: Project record documents.

1.03 DEFINITIONS

A. REQUEST FOR INFORMATION (R.F.I.'s):

1. Requests for Information may be generated by the Contractor, any of the Contractor's subcontractors or the Owner's Inspector and should be directed to the Architect through the General Contractor using the form provided at the end of this section. Request for Information forms are used to help clarify and/or interpret the information contained in the Contract Documents or to resolve construction questions in the field.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

A. District will schedule a meeting after Notice of Award.

B. Attendance Required:

1. School District Representative.
2. Architect.
3. Contractor.
4. Inspector.
5. Project Superintendent.

C. Agenda:

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

D. Architect shall record minutes and distribute copies within five days after meeting to participants, with copies to Contractor, School District, Project Inspector, participants, and those affected by decisions made.

3.02 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at an interval to be determined by the District.

B. Architect will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required: School District Representative, Architect, Project Inspector, Job Superintendent, Major Subcontractors and suppliers, as appropriate to agenda topics for each meeting.

D. Agenda:
   1. Review minutes of previous meetings.
   2. Review of Work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Review of off-site fabrication and delivery schedules.
   7. Contractor update on Safety Program / Storm Water Management.
   8. Maintenance of progress schedule.
   9. Corrective measures to regain projected schedules.
   10. Planned progress during succeeding work period.
   11. Maintenance of quality and work standards.
   12. Effect of proposed changes on progress schedule and coordination.
   13. Other business relating to Work.

E. The Architect will record minutes and distribute copies prior to the next meeting to participants, with copies to the Owner, Inspector, Contractor, other participants, and those affected by decisions made.

F. The Progress Meetings are intended to be conducted in an orderly and professional manner. Any foul language or unprofessional conduct will not be tolerated, and will result in the cessation of the meeting. Meetings shall not be recorded without the concurrence of all parties in attendance.

3.03 CONSTRUCTION PROGRESS SCHEDULE - SEE SECTION 01 3216

A. Refer to Article 7 of the General Conditions for requirements.

B. The first payment will not be made unless the District has been provided and has accepted the project schedule.

C. Submit updated schedule with each Application for Payment.

3.04 REQUEST FOR INFORMATION

A. Request for Information (RFI): Requests for Information may be generated by the Contractor, any of the Contractor's subcontractors or the Owner's Inspector and should be directed to the Architect through the General Contractor using the form provided at the end of this section. Request for Information forms are used to help clarify and/or interpret the information contained in the contract documents or to resolve construction questions in the field.
   1. The Architect shall respond in writing within three (3) working days of receipt of the RFI. The Architect will promptly advise the Contractor when a Request for Information being processed will be delayed beyond three (3) working days due to a need for additional information, research or coordination. The Contractor should allow sufficient review time so that the work will not be delayed as a result of the time required to process RFI's. No extension of contract time will be authorized because of failure by the Contractor to transmit RFI's to the Architect sufficiently in advance of work to permit processing.
   2. Deductions for Unnecessary or Redundant RFI's: Should the Contractor or the Contractor's subcontractor submit unnecessary or redundant RFI's to the Architect for review, the Architect shall be entitled to bill the Owner at his (Architect's) hourly rate for the additional work generated by the Contractor's inefficiency. The Owner shall then deduct the comparable dollar amount from the payments due the Contractor.
   3. Unnecessary and/or Redundant RFI's Include (But Are Not Limited To):
      a. RFI's questioning items or information clearly noted in the contract documents.

b. RFI's generated as a result of a Contractor's substitution or construction error which requires additional coordination with other related items or a revision to the contract documents.

END OF SECTION

SECTION 01 3010
SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittal Log

B. Preparing and processing of submittals for review and action.

C. Preparing and processing of informational submittals.

1.02 DEFINITIONS

A. "Shop drawings" are drawings and other data prepared, by the entity who is to do the work, specifically to show a portion of the work.

B. "Product data submittals" are standard printed data which show or otherwise describe a product or system, or some other portion of the work.
   1. Product data submittals also include:
      a. Performance curves, when issued by the manufacturer for all products of that type.
      b. Selection data showing standard colors.
      c. Wiring diagrams, when standard for all products of that type.

C. "Samples" are actual examples of the products or work to be installed.

D. Informational Submittals: Submittals identified in the contract documents as to be submitted for information only.

1.03 SUBMITTAL LOG

A. Contractor shall prepare submittal log in format approved by the Architect and School District.

B. As a minimum the submittal log shall list all submittals required by the contract documents, with assigned submittal number, corresponding specification section and description of submittal.

1.04 SUBMITTALS FOR REVIEW

A. Submit the following for the architect's review and action:
   1. Shop drawings.
   2. Structural design information required by the contract documents.
   3. Product data.
   4. Samples.
   5. Submittals indicated as "for approval."
   6. Submittals for which procedures are not defined elsewhere.

B. Submit to Architect for review for the limited purpose of checking fro conformance with information given and the design concept expressed in the contract documents.

C. Samples will be reviewed only for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01780 - Closeout Submittals.

1.05 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Certificates.
   2. Coordination drawings.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Qualification statements from manufacturers / installers.
   8. Verified Reports in accordance with Title 24, Part 1, Article 47336, C.C.R.

1.06 SUBMITTALS FOR PROJECT CLOSEOUT

A. When the following are specified in individual sections, submit them at project closeout:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.
   5. Other types as indicated.

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

1.07 SUBMITTAL REQUIREMENTS

A. Do not commence work that requires review of any submittals until receipt of returned submittals with an acceptable action.

B. Do not allow submittals without an acceptable action marking to be used for the project.

C. Submit all submittals to the Architect.

D. All Submittals for the project shall be delivered to the Architect's office within five (5) days from the Notice to Proceed.

E. Do not submit substitute items that have not been approved by means of the procedure specified elsewhere.

F. Do not include requests for substitution (either direct or indirect) on submittals; comply with procedures for substitutions specified elsewhere.

G. Related Sections: The following are specified elsewhere in Division 1:
   1. 01 2000 - PRICE AND PAYMENT PROCEDURES
      a. Payment, modification, and completion submittals.
         1) Applications for payment.
         2) Schedule of values.
         3) Change proposals.
   2. 01 3216 - CONSTRUCTION PROGRESS SCHEDULE
      a. Progress of work submittals:
         1) Contractor's construction schedules.
   3. 01 4000 - QUALITY REQUIREMENTS
      a. Quality control submittals:
         1) Inspection reports.
         2) Test reports.
   4. 01 6000 - PRODUCT REQUIREMENTS
      a. Product submittals:
         1) Requests for Substitution.
         2) Maintenance materials and tools.
   5. 01 7800 - CLOSEOUT SUBMITTALS
      a. Contract closeout submittals:
         1) Equipment and systems demonstration reports.
         2) Operating and maintenance data.
         3) Request for determination of substantial completion.
         4) Project record documents.
         5) Warranties.
         6) Bonds.

1.08 NUMBER OF COPIES OF SUBMITTALS

A. Documents for Review:
   1. Small Size Sheets, Not Larger Than 8-1/2 x 11 inches: Submit the number of copies which the Contractor requires, plus [four] copies which will be retained by the Architect.
   2. Larger Sheets, Not Larger Than 36 x 48 inches: Submit the number of opaque reproductions which Contractor requires, plus [four] copies which will be retained by

Architect.

3. In lieu of hard copy submittals, electronic submittals are acceptable except for material and/or color selection samples.

B. Documents for Information: Submit [three] copies.

C. Documents for Project Closeout: Make one reproduction of submittal originally reviewed. Submit one extra of submittals for information.

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

E. Copies in excess of the number requested will not be returned.

F. Provide additional copies, if required for operating and maintenance data, marked to indicate their purpose.

1.09 SUBMITTAL PROCEDURES

A. Coordination:
   1. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
      a. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
      b. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
      c. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.

B. Processing:
   1. Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
      a. For each submittal for review, allow 5 days excluding delivery time to and from the Architect. Allow additional time if processing time must be delayed to permit coordination with subsequent submittals. The Architect shall promptly advise the General Contractor when a submittal being processed must be delayed for coordination.
         1) Exceptions:
            (a) Deferred Approval Submittal through the Division of the State Architect's office. Due to the nature of these submittals, no estimated return date can be given.
            (b) Complicated Shop Drawings may require more than ten days for proper review time and coordination.
            (c) If numerous Submittals are provided within a short period of time, the review time may not be able to be met. In these cases, the Contractor should clearly identify on the Submittal Transmittal which Submittals have the highest priority in terms of the Project Schedule and related construction activities.
      b. If an intermediate submittal is necessary, process the same as the initial submittal.
      c. Allow two weeks for reprocessing each submittal.
      d. When revised for resubmission, identify all changes made since previous submission.
      e. No extension of Contract Time will be authorized because of the failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing and review.

C. Submittal Preparation:
   1. Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

a. Provide a space approximately 4" x 5" on the label or besides the title block on Shop Drawings to record the Architect's/Engineer's review and approval markings and the action taken.
b. Include the following information on the label for processing and recoding action taken:
    1) Project Name.
    2) Date.
    3) Name and address of Architect.
    4) Name and address of District.
    5) Name and address of Subcontractor.
    6) Name and address of Supplier.
    7) Name of manufacturer.
    8) Number and title of the appropriate Specification Section.
    9) Drawing number and detail references, as appropriate.

D. Submittal Transmittal:
1. Package each submittal appropriately for transmittal and handling. Transmit each submittal from District or General Contractor to Architect using a standard "Submittal Transmittal" form in a format that is acceptable to the Architect and District. Submittals received from sources other than the District or General Contractor will be returned without action.
2. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
3. On the transmittal, record relevant information and requests for data.
4. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.
5. Deliver submittals to Architect at business address.
6. Schedule submittals to expedite the Project, and coordinate submission of related items.
7. Identify all variations from Contract Documents, and all Product or system limitations which may be detrimental to successful performance of the completed Work.
    a. Failure to identify all variations and limitations will be cause for retroactive rejection of submittals previously approved.

E. Distribution:
1. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

1.10 COORDINATION OF SUBMITTALS

A. Coordinate submittals and activities that must be performed in sequence, so that the architect has enough information to properly review the submittals.

B. Coordinate submittals of different types for the same product or system so that the architect has enough information to properly review each submittal.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 TIMING OF SUBMITTALS

A. Transmit each submittal at or before the time indicated on the approved schedule of submittals.
1. Prepare and submit for approval a schedule showing the required dates of submittal of all submittals.
2. Organize the schedule by the applicable specification section number.
3. Incorporate the contractor's construction schedule specified elsewhere.
4. ALL SUBMITTALS FOR THE PROJECT SHALL BE DELIVERED TO THE ARCHITECT'S OFFICE WITHIN FIVE (5) DAYS FROM THE NOTICE TO PROCEED.

B. Deliver each submittal requiring approval in time to allow for adequate review and processing time, including resubmittals if necessary; failure of the contractor in this respect will not be

considered as grounds for an extension of the contract time.

C. Deliver each informational submittal prior to start of the work involved, unless the submittal is of a type which cannot be prepared until after completion of the work; submit promptly.

D. Allow a minimum of 5 business days for the first processing of each submittal. Allow more time when submittals must be coordinated with later submittals, or are more technical in nature and require more review and coordination time.

E. Allow a minimum of 3 business days for processing of resubmittals.

F. If a submittal must be delayed for coordination with other submittals not yet submitted, the architect may at his option either return the submittal with no action or notify the contractor of the other submittals, which must be received before the submittal can be reviewed.

3.02 SUBMITTAL PROCEDURES - GENERAL

A. Contractor Review: Sign each copy of each submittal certifying compliance with the requirements of the contract documents.

B. Notify the architect, in writing and at time of submittal, of all points upon which the submittal does not conform to the requirements of the contract documents, if any. All deviations form the Contract Documents must be clearly indicated on the submittal. All submittals for materials or equipment other than that specified must be submitted with properly completed Substitution Request Form.

C. Preparation of Submittals:
   1. Label each copy of each submittal, with the following information:
      a. Project name.
      b. Date of submittal.
      c. Contractor's name and address.
      d. Architect's name and address.
      e. Subcontractor's name and address.
      f. Manufacturer's name.
      g. Specification section where the submittal is specified.
      h. Numbers of applicable drawings and details.
      i. Other necessary identifying information.
   2. Pack submittals suitably for shipment.
   3. Submittals to receive architect's action marking: Provide blank space on the label or on the submittal itself for action marking; minimum 4 inches wide by 5 inches high.

D. Transmittal of Submittals:
   1. Submittals will be accepted from the contractor only. Submittals received from other entities will be returned without review or action.
   2. Submittals received without a transmittal form will be returned without review or action.
   3. Transmittal form: Use a form matching the sample form attached to this section.
   4. Fill out a separate transmittal form for each submittal; also include the following:
      a. Other relevant information.
      b. Requests for additional information.

3.03 SHOP DRAWINGS

A. Content: Include the following information:
   1. Dimensions, at accurate scale.
   2. All field measurements that have been taken, at accurate scale.
   3. Names of specific products and materials used.
   4. Details, identified by contract document sheet and detail numbers.
   5. Show compliance with the specific standards referenced.
   6. Coordination requirements; show relationship to adjacent or critical work.
   7. Name of preparing firm.

B. Preparation:
   1. Reproductions of contract documents are not acceptable as shop drawings.

2. Space for architect's action marking shall be adjacent to the title block.

3.04 PRODUCT DATA

A. Content:
   1. Submit manufacturer's standard printed data sheets.
   2. Identify the particular product being submitted; submit only pertinent pages.
   3. Show compliance with properties specified.
   4. Identify which options and accessories are applicable.
   5. Show compliance with the specific standards referenced.
   6. Show compliance with specified testing agency listings; show the limitations of their labels or seals, if any.
   7. Identify dimensions which have been verified by field measurement.
   8. Show special coordination requirements for the product.

3.05 SAMPLES

A. Samples:
   1. Provide samples that are the same as proposed product.
   2. Where unavoidable variations must be expected, submit "range" samples, minimum of 3 units, and describe or identify variations among units of each set.
   3. Where selection is required, provide full set of all options.

B. Preparation:
   1. Attach a description to each sample.
   2. Attach name of manufacturer or source to each sample.
   3. Where compliance with specified properties is required, attach documentation showing compliance.
   4. Where there are limitations in availability, delivery, or other similar characteristics, attach description of such limitations.
   5. Where selection is required, the first submittal may be a single set of all options; after return of submittal with selection indicated, submit standard number of sets of selected item.

C. Keep final sample set(s) at the project site, available for use during progress of the work.

3.06 REVIEW OF SUBMITTALS

A. Submittals for approval will be reviewed, marked with appropriate action, and returned.
   1. Informational submittals: Submittals will be reviewed.

3.07 RETURN, RESUBMITTAL, AND DISTRIBUTION

A. Submittals will be returned to the contractor by mail.Perform resubmittals in the same manner as original submittals; indicate all changes other than those requested by the architect.

B. Perform resubmittals in the same manner as original submittals; indicate all changes other than those requested by the architect.
   1. Exception: Transmittal number for resubmittals shall be the number of the original submittal plus a letter suffix; example: 05500-1 would become 05500-1 A.

C. Distribution:
   1. Distribute returned submittals to all subcontractors and suppliers involved in work covered by the submittal.
   2. Make one copy for project record documents.

END OF SECTION

SECTION 01 3216
CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preliminary schedule.

B. Construction progress schedule, bar chart type.

1.02 REFERENCES

A. AGC (CPSM) - Construction Planning and Scheduling Manual 2004.

1.03 SUBMITTALS

A. Within 10 days after date of Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
   1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

F. Submit the number of opaque reproductions that Contractor requires, plus three copies that will be retained by Architect.

G. Submit under transmittal letter form specified in Section 01 3000 - Administrative Requirements.

1.04 QUALITY ASSURANCE

A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with one years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.

1.05 SCHEDULE FORMAT

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

B. Diagram Sheet Size: Maximum 30 x 42 inches or width required.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE

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

3.02 CONTENT

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

B. Identify each item by specification section number.

C. Identify work of separate stages and other logically grouped activities.

D. Provide sub-schedules for each stage of Work identified in Section 01 1000.

E. Provide sub-schedules to define critical portions of the entire schedule.

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

G. Provide separate schedule of submittal dates for shop drawings, product data, and samples, owner-furnished products, and dates reviewed submittals will be required from Architect. Indicate decision dates for selection of finishes.

H. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS

A. Include a separate bar for each major portion of Work or operation.

B. Identify the first work day of each week.

3.04 UPDATING SCHEDULE

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

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

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

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

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit reports required to support recommended changes.

G. Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect including the effects of changes on schedules of separate contractors.

3.05 DISTRIBUTION OF SCHEDULE

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

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

END OF SECTION

SECTION 01 4000
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.

B. References and standards.

C. Control of installation.

D. Testing and inspection agencies and services.

E. Control of installation.

F. Manufacturers' field services.

G. Defect Assessment.

1.02 RELATED REQUIREMENTS

A. Section 01 3010 - Submittals: Submittal procedures.

B. Section 01 4219 - Reference Standards.

1.03 SUBMITTALS

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

B. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
   1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
   2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

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

D. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
   1. Submit report in duplicate within 30 days of observation to Architect for information.
   2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

E. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.
   1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
   2. Data indicating inappropriate or unacceptable Work may be subject to action by Architect or Owner.

1.04 REFERENCES AND STANDARDS

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

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

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

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

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

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

1.05 TESTING AND INSPECTION AGENCIES AND SERVICES

A. Owner will employ and pay for services of an independent testing agency to perform other specified testing. Refer to Section 01 9010 - Testing and Inspection Requirements.

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

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

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

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

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

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

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

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

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

3.02 TESTING AND INSPECTION

A. See Specification Section 01 9010 for testing required.

B. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
      c. To facilitate tests/inspections.
      d. To provide storage and curing of test samples.
   4. Notify Architect and laboratory 48 hours prior to expected time for operations requiring testing/inspection services.
   5. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

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

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

E. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by the Architect. Payment for re-testing will be charged to

the Contractor by deducting testing charges from the Contract Sum/Price.

3.03 MANUFACTURERS' FIELD SERVICES

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

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

3.04 DEFECT ASSESSMENT

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

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

END OF SECTION

SECTION 01 4219
REFERENCE STANDARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements relating to referenced standards.

1.02 QUALITY ASSURANCE

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

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

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

PART 2 CONSTRUCTION INDUSTRY ORGANIZATION DOCUMENTS

2.01 AA -- ALUMINUM ASSOCIATION, INC.

2.02 AAMA -- AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels 2013.

B. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site 2015.

2.03 AASHTO -- AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS

A. AASHTO GDPS - Guide for Design of Pavement Structures 1993 with 1998 supplement.

B. AASHTO GDPS-3 - Guide for Design of Pavement Structures, Volume 2; 1986.

C. AASHTO M 36 - Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains 2014.

D. AASHTO M 147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses 1965 (2004).

E. AASHTO T 27 - Standard Specification for Sieve Analysis of Fine and Course Aggregates; 2006.

F. AASHTO T 180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop 2010.

2.04 ACI -- AMERICAN CONCRETE INSTITUTE INTERNATIONAL

A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials 2010.

B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete 1991 (Reapproved 2009).

C. ACI 347R - Guide to Formwork for Concrete 2014.

2.05 AGC -- ASSOCIATED GENERAL CONTRACTORS OF AMERICA

A. AGC (CPSM) - Construction Planning and Scheduling Manual 2004.

2.06 AMCA -- AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL, INC.

A. AMCA 511 - Certified Ratings Program for Air Control Devices 2010.

2.07 ASTM A SERIES -- ASTM INTERNATIONAL

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2014.

B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2012.

C. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished 2013.

D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2015.

E. ASTM A135/A135M - Standard Specification for Electric-Resistance-Welded Steel Pipe 2009 (Reapproved 2014).

F. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates 2013.

G. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength 2014.

H. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric) 2014.

I. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2013.

J. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing 2014.

K. ASTM A513/A513M - Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing 2015.

L. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts 2007a (Reapproved 2014).

M. ASTM A563M - Standard Specification for Carbon and Alloy Steel Nuts [Metric] 2007.

N. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel 2015.

O. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement 2015.

P. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2015.

Q. ASTM A706/A706M - Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement 2014.

R. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process 2010 (Reapproved 2015).

S. ASTM A992/A992M - Standard Specification for Structural Steel Shapes 2011 (Reapproved 2015).

T. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2014.

U. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete 2015.

2.08 ASTM B SERIES -- ASTM INTERNATIONAL

A. ASTM B88 - Standard Specification for Seamless Copper Water Tube 2014.

B. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2014.

C. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric] 2013.

D. ASTM B241/B241M - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube 2012.

2.09 ASTM E SERIES -- ASTM INTERNATIONAL

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

B. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C 2012.

C. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover 2008a (Reapproved 2013).

D. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference 2014.

E. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source 2014c.

F. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests 2005 (Reapproved 2012).

G. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings 2013.

H. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings 2000 (Reapproved 2006).

I. ASTM E1264 - Standard Classification for Acoustical Ceiling Products 2014.

J. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation 2010.

2.10 AWS -- AMERICAN WELDING SOCIETY

A. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2012.

B. AWS D1.1/D1.1M - Structural Welding Code - Steel 2015.

C. AWS D1.4/D1.4M - Structural Welding Code - Reinforcing Steel 2011.

2.11 CSSB -- CEDAR SHAKE AND SHINGLE BUREAU

A. CSSB (WEB) - [Grade Standards and Installation Recommendations as Posted at www.cedarbureau.org]; Cedar Shake and Shingle Bureau current edition.

2.12 GA -- GYPSUM ASSOCIATION

A. GA-216 - Application and Finishing of Gypsum Board 2013.

2.13 GANA -- GLASS ASSOCIATION OF NORTH AMERICA

A. GANA (GM) - GANA Glazing Manual 2009.

B. GANA (SM) - GANA Sealant Manual 2008.

2.14 ICC -- INTERNATIONAL CODE COUNCIL, INC.

A. ICC (IBC) - International Building Code 2015.

2.15 ICC-ES - ICC EVALUATION SERVICE, INC.

2.16 NAAMM -- THE NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS

A. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames 2007.

2.17 NCMA -- NATIONAL CONCRETE MASONRY ASSOCIATION

A. MVMA (AMSV) - Installation Guide for Adhered Manufactured Stone Veneer 2017.

2.18 NEMA -- NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

2.19 NFPA -- NATIONAL FIRE PROTECTION ASSOCIATION

A. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2012.

B. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source 2015.

2.20 RIS -- REDWOOD INSPECTION SERVICE

A. RIS (GR) - Standard Specifications for Grades of California Redwood Lumber 2000.

2.21 SCAQMD -- SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

A. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168 current edition.

2.22 TCNA -- TILE COUNCIL OF NORTH AMERICA, INC.

A. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation 2015.

2.23 TMS -- THE MASONRY SOCIETY

A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures 2016.

2.24 WCMA -- WINDOW COVERING MANUFACTURERS ASSOCIATION

A. WCMA A100.1 - Safety of Corded Window Covering Products Current Edition, Including All Revisions.

END OF SECTION

SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary telecommunications services.

B. Temporary sanitary facilities.

C. Temporary Controls: Barriers, enclosures, and fencing.

D. Security requirements.

E. Vehicular access and parking.

F. Waste removal facilities and services.

G. Field offices.

1.02 TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.

B. Provide, maintain, and pay for telephone service to field office and Inspector's field office at time of project mobilization through to project completion.

C. Provide, maintain and pay for facsimile service and a dedicated telephone line to field office and Inspector's field office at time of project mobilization through to project completion.

1.03 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization through to project completion.

B. Maintain daily in clean and sanitary condition.

1.04 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.

C. Provide protection for plants designated to remain. Replace damaged plants.

D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.05 FENCING

A. Construction: Commercial grade chain link fence.

B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks as required.

1.06 SECURITY

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.07 VEHICULAR ACCESS AND PARKING

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

B. Coordinate access and haul routes with governing authorities and Owner.

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

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

1.08 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site weekly.

C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

1.09 FIELD OFFICES

A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack and drawing display table.

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

C. Provide separate private office similarly equipped and furnished, for use of the Project Inspector.

1.10 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.

B. Clean and repair damage caused by installation or use of temporary work.

C. Restore existing facilities used during construction to original condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 6000
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Re-use of existing products.

C. Transportation, handling, storage and protection.

D. Product option requirements.

E. Substitution limitations and procedures.

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

1.02 RELATED REQUIREMENTS

A. Section 01 4000 - Quality Requirements: Product quality monitoring.

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

1.03 SUBMITTALS

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

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

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

D. Indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

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

B. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site. However, The Owner has the first right of refusal on all existing materials and equipment indicated to be removed, but not to be re-used.

2.02 NEW PRODUCTS

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

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

C. Where all other criteria are met, Contractor shall give preference to products that:
   1. If used on interior, have lower emissions, as defined in Section 01 6116.
   2. If wet-applied, have lower VOC content, as defined in Section 01 6116.
   3. Have a published GreenScreen Chemical Hazard Analysis.

D. Provide interchangeable components of the same manufacture for components being replaced.

2.03 PRODUCT OPTIONS

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

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

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

2.04 MAINTENANCE MATERIALS

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

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

PART 3 EXECUTION

3.01 SUBSTITUTIONS DURING THE BIDDING PERIOD

A. Substitution requests submitted later than 7 days prior to the Bid Date will not be considered.

B. Acceptable substitutions will be added to the contract documents by addendum; no verbal approvals will be valid.

3.02 SUBSTITUTIONS AFTER AWARD OF THE CONTRACT

A. Substitutions will not be considered between the Bid date and the Award of the Contract.

B. Substitutions will not be allowed after Award of the Contract except when, through no fault of the Contractor, none of the specified products are available.
   1. Architect will consider requests for substitutions only within 30 days after date of Agreement.

3.03 SUBSTITUTION PROCEDURES

A. Instructions to Bidders specifies time restrictions for submitting requests for substitutions during the bidding period and the documents required. Comply with requirements specified in Section 00 2113.

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

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

D. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

E. Substitutions will not be considered when submitted directly by subcontractor or supplier.

F. Substitution Submittal Procedure: Submit written request with complete data substantiating compliance of the proposed product with the requirements of the Contract Documents, utilizing the form provided at the end of this section.
   1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
   2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.

3. Substitutions shall be considered as a Change Order, and shall be approved by DSA prior to fabrication or use.
4. The Architect will notify Contractor in writing of decision to accept or reject request.

G. Data Required with Substitution Request: Provide at least the following data:
1. Identify product by specification section and paragraph number.
2. Manufacturer's name and address, trade name and model number of product (if applicable), and name of the fabricator or supplier (if applicable).
3. Complete Product Data.
4. A list of other projects on which the proposed product has been used, with Project Name, the Design Professionals name, and Owner contact.
5. A itemized side-by-side comparison of the proposed product to the specified product.
6. Net amount of change to the contract sum.
7. List of maintenance services and replacement materials available.
8. Statement of the effect of the substitution on the construction schedule.
9. Description of changes that will be required in other work or products if the substitute product is approved.

H. The Architect will determine the acceptability of the proposed substitution.

I. There are certain items and/or products that are specified for this project that are District Standards, where no substitutions will be accepted. If this is the case, the Substitution Request related to a District Standard shall be responded to stating such fact.

J. When the proposed substitution is accepted, provide the product (or one of the products, as the case may be) specified.

K. All changes in the work that affects the Structural, Access, or Fire & Life Safety portions of the project shall be submitted to DSA for review and approval as required per CBC 2016 Part 1 Section 4-338.

3.04 TRANSPORTATION AND HANDLING

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

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

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

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

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

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

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

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

3.05 STORAGE AND PROTECTION

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

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

C. Store with seals and labels intact and legible.

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

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

F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.

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

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

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

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

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

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

END OF SECTION

SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

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

C. Pre-installation meetings.

D. Cutting and patching.

E. Cleaning and protection.

F. Starting of systems and equipment.

G. Demonstration and instruction of Owner personnel.

H. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

A. Section 01 3010 - Submittals: Submittal procedures.

B. Section 01 7800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties and bonds.

1.03 SUBMITTALS

A. See Section 01 3010 - Submittals, for submittal procedures.

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

1.04 PROJECT CONDITIONS

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

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

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

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

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

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

1.05 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

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

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

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

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

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

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

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

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

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

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

PART 3 EXECUTION

3.01 EXAMINATION

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

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

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

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

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

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

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

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

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

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Architect seven days in advance of meeting date.

D. Prepare agenda and preside at meeting:
   1. Review conditions of examination, preparation and installation procedures.
   2. Review coordination with related work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

A. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
   2. Grid or axis for structures.

B. Periodically verify layouts by same means.

3.05 GENERAL INSTALLATION REQUIREMENTS

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

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

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

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as shown.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.
   2. Relocate items indicated on drawings.
   3. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
   4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

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

D. Protect existing work to remain.

1. Prevent movement of structure; provide shoring and bracing if necessary.
2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
3. Repair adjacent construction and finishes damaged during removal work.
4. Patch as specified for patching new work.

E. Adapt existing work to fit new work: Make as neat and smooth transition as possible.

F. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

G. Refinish existing surfaces as indicated:

H. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.

I. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
   1. Patch as specified for patching new work.

J. Clean existing systems and equipment.

K. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

L. Do not begin new construction in alterations areas before demolition is complete.

M. Comply with all other applicable requirements of this section.

3.07 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

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

D. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.

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

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

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

H. Restore work with new products in accordance with requirements of Contract Documents.

I. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.

3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

J. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

K. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.

L. Patch or replace surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. Repair substrate prior to patching finish. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.08 PROGRESS CLEANING

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

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

3.09 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

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

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

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

3.10 DEMONSTRATION AND INSTRUCTION

A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.

B. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of owner personnel.

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

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

3.11 ADJUSTING

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

3.12 FINAL CLEANING

A. Execute final cleaning after Substantial Completion but before making final application for payment.

B. Use cleaning materials that are nonhazardous.

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

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

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

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

3.13 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Furnish service and maintenance of components indicated in specification sections for one year from date of Substantial Completion.

D. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

E. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

F. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION

SECTION 01 7410
CLEANING

PART 1 GENERAL

1.01 SCOPE

A. Throughout the construction period, maintain the buildings and site in a standard of cleanliness as described in this Section.

1.02 RELATED WORK

A. In addition to standards described in this Section, comply with requirements for cleaning as described in pertinent other Sections of these Specifications.

1.03 QUALITY ASSURANCE

A. Conduct daily inspections, and more often if necessary, to verify that requirements for cleanliness are being met.

B. In addition to the standards described in this Section, comply with pertinent requirements of governmental agencies having jurisdiction.

PART 2 PRODUCTS

2.01 CLEANING MATERIALS AND EQUIPMENT

A. Provide required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

2.02 COMPATIBILITY

A. Use only the cleaning materials and equipment, which are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

PART 3 EXECUTION

3.01 PROGRESS CLEANING

A. General:
   1. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.
   2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this Work.
   3. At least twice each month, and when requested by the District Representative, completely remove all scrap, debris, and waste material from the job site.
   4. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.

B. Site:
   1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
   2. Weekly, and more often, if necessary, inspect all arrangements of materials stored on the site. Restack, tidy, or otherwise service arrangements to meet the requirements of subparagraph 3.01 A above.
   3. Maintain the site in a neat and orderly condition at all times.

3.02 FINAL CLEANING

A. "Clean", for the purpose of this Article, and except as may be specifically provided otherwise, shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.

B. Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Article 3.01 above.

C. Site:
   1. Unless otherwise specifically directed by the Construction Manager, broom clean paved areas on the site and public paved areas adjacent to the site.

2. Completely remove resultant debris.

D. Schedule final cleaning as approved by the Architect to enable the District to accept a completely clean Work.

3.03 CLEANING DURING DISTRICT'S OCCUPANCY

A. Should the District occupy the Work or any portion thereof prior to its completion by the Trade Contractor and acceptance by the District, responsibilities for interim and final cleaning shall be as determined by the Architect in accordance with the General Conditions of the Contract.

3.04 TRADE CONTRACTOR RESPONSIBILITY FOR MISUSE OF MATERIALS

A. Should construction materials or debris created by the construction process not be properly stored in a secure area or placed in the proper secured debris containers and such materials are used in acts of vandalism, the contractor shall be responsible to the District and adjacent property Districts for the repair or replacement of items damaged in such vandalism.

END OF SECTION

SECTION 01 7700
PROJECT CLOSEOUT

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:
   1. Requirements preparatory to Final Inspection.
   2. Final Inspection Procedures.

B. The work includes performing all operations necessary for and properly incidental to closing out the project and assisting in Owner's final inspection as hereinafter specified. The Conditions of the Contract and the other sections of Division 1 apply to this section as fully as if repeated herein.

C. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 16.

1.02 RELATED SECTIONS

A. 01 2000 - Price and Payment Procedures; Procedures for preparation and submittal of application for final payment.

B. 01 7000 - Execution Requirements; Starting of systems and equipment and demonstration and instruction of Owner personnel.

C. 01 7410 - Cleaning; Final cleaning requirements.

D. 01 7800 - Closeout Submittals; Project Record Documents, Operation and Maintenance Data and Warranties and Bonds.

1.03 REQUIREMENTS PREPARATORY TO FINAL INSPECTION

A. All temporary facilities shall be removed from the site as specified in Division 01 5000 sections.

B. The site shall be thoroughly cleaned as specified in Section 01 7410.

C. Record (As-built) Drawings shall be completed, signed, and submitted to the Architect as specified in Section 01 7800 - Closeout Submittals.

D. The Material and Equipment maintenance instructions, as specified in the body of the Specifications, shall be submitted to the Architect.

E. All guarantees and warranties shall be submitted to the Architect as specified in the General Conditions, and Section 01 7800 - Closeout Submittals.

1.04 FINAL INSPECTION PROCEDURES

A. After all requirements preparatory to the final inspection have been completed as herein before specified, the Contractor shall notify the Architect to perform the final inspection. Notice shall be given at least one week of the time the final inspection is to be performed.

B. On receipt of a request for inspection, the Architect will either proceed with inspection or advise the Contractor of unfulfilled requirements. The Architect will prepare the Certificate of Substantial Completion following inspection, or advise the Contractor by preparing a punch list of construction that must be completed or corrected before the certificate will be issued.

C. The Contractor or his principal superintendent, authorized to act in behalf of the Contractor, shall accompany the Architect, Consultants and Owner on the final inspection tour, as well as principal subcontractors that the Architect, Consultants or Owner may request to be present.

D. If the work has been completed in accordance with the Contract Documents, and no further corrective measures are required, the Owner will accept the Project and will include the Notice of Completion on the next Board Agenda for approval by the Board of Trustees.

E. Failure to include an item on the Punch List does not alter the responsibility of Contractor to complete all Work in accordance with the Contract Documents.

F. If the work has not been substantially completed in accordance with the Contract Documents, and numerous corrective measures are still required, the Owner will not accept the Project nor file for the Notice of Completion. Instead, a Punch List will be prepared, based on the information gathered from the final inspection, and the Contractor will be required to complete this work and then call for another final inspection, following the procedures outlined above.

G. The Architect will repeat inspection when requested and assured that the Work has been substantially completed. If the re-inspection discloses any item not included on the initial Punch List the Contractor shall add these items to the Punch List.

H. Results of the completed inspection will form the basis of requirements for final acceptance.

1.05 FINAL ACCEPTANCE

A. PRELIMINARY PROCEDURES:

1. Submit final payment request in compliance with Article 37 of the General Conditions.
2. Submit a certified copy of the Architect's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect.
3. Submit consent of surety to final payment.
4. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
5. Submit evidence that DSA Form 6-C Contractor's Verified Report has been filed with the Division of the State Architect.

END OF SECTION

SECTION 01 7800
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

A. Section 01 3010 - Submittals: Submittal procedures, shop drawings, product data, and samples.

B. Section 01 7000 - Execution and Closeout Requirements: Contract closeout procedures.

C. Individual Product Sections: Specific requirements for operation and maintenance data.

D. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

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

B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
   4. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Prepare a full set of transparencies of contract drawings with all record changes marked.
      a. The architect will furnish to the contractor transparencies (erasable vellums) of the original contract drawings at the cost of $10.00 (ten dollars) per sheet.
   2. Measured depths of foundations in relation to finish first floor datum.
   3. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   4. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   5. Field changes of dimension and detail.
   6. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

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

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

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

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

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:
   1. Product data, with catalog number, size, composition, and color and texture designations.
   2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

D. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

E. Provide servicing and lubrication schedule, and list of lubricants required.

F. Include manufacturer's printed operation and maintenance instructions.

G. Include sequence of operation by controls manufacturer.

H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

I. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

D. Prepare data in the form of an instructional manual.

E. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

F. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

G. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

H. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

I. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

J. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.

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

L. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.

M. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
      f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.

3. Part 3: Project documents and certificates, including the following:
    a. Shop drawings and product data.
    b. Air and water balance reports.
    c. Certificates.
    d. Photocopies of warranties and bonds.

N. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.

3.06 WARRANTIES AND BONDS

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

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

C. Co-execute submittals when required.

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

E. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.

F. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.

G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.

H. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

END OF SECTION

SECTION 01 9010
TESTING AND INSPECTION REQUIREMENTS

PART 1 GENERAL

1.01 RELATED SECTIONS

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

1.02 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of the following, except where requirements of the contract documents or of governing codes and authorities having jurisdiction are more stringent:
   1. Title 24, Part 1 - Administrative Regulations of the State Building Standards Commission.
   2. Title 24, Part 2 - California Building Code (CBC); 2022 California Building Code.
   3. Title 24, Part 4 - California Fire Code (CFC); 2022 California Fire Code.

B. Testing Laboratory Services:
   1. The owner will engage an independent testing agency to conduct tests and perform other services required for quality assurance.

1.03 TESTS

A. The Owner will select an independent testing laboratory to conduct the tests. Selection of the material required to be tested shall be by the laboratory or the Owner's representative and not by the contractor. See Form DSA-103-1, "Structural Tests and Inspections" for tests and inspections required to be performed under this contract.

B. The Owner will select an independent testing laboratory to conduct the tests. Selection of the material required to be tested shall be by the laboratory or the Owner's representative and not by the contractor.

1.04 TEST REPORTS

A. One copy of all test reports shall be forwarded to the Owner, Architect, Structural Engineer, Inspector of Record (IOR), and Contractor by the testing agency. Such reports shall include all tests made, regardless of whether such tests indicate that the material is satisfactory or unsatisfactory. Samples taken but not tested shall also be reported. Records of special sampling operations as required shall also be reported. The reports shall show that the material or materials were sampled and tested in accordance with the requirements of Title 24 and with the approved specifications. Test reports shall show the specified design strength. They shall also state definitely whether or not the material or materials tested comply with the requirements.

1.05 VERIFICATION OF TEST REPORTS

A. Each testing agency shall submit to the Architect a verified report in duplicate covering all of the tests which are required to be made by that agency during the progress of the project. Such reports shall be furnished each time that work on the project is suspended, covering the tests up to that time, and at the completion of the project, covering all tests.

1.06 INSPECTION BY THE OWNER

A. The Owner and his representatives shall at all times have access for the purpose of inspection to all parts of the work and to the shops wherein the work is in preparation. The Contractor shall at all times maintain proper facilities and provide safe access for such inspection. The Owner shall have the right to reject materials and workmanship, which are defective, or to require their correction. Rejected workmanship shall be satisfactorily corrected and rejected materials shall be removed from the premises without charge to the Owner. If the Contractor does not correct such rejected work within a reasonable time, fixed by written notice, the Owner may correct same and charge the expense to the Contractor. Should it be considered necessary or advisable by the Owner at any time before final acceptance of the entire work to make an examination of work already completed by removing or tearing out the same, the Contractor shall on request promptly furnish all necessary facilities, labor and materials. If such

work is found to be defective in any respect due to fault of the Contractor or his subcontractor, he shall defray all expenses of such examinations and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the Contract, the additional cost of labor and material necessarily involved in the examination and replacement shall be allowed the Contractor.

1.07 INSPECTOR - OWNER'S

A. An Inspector employed by the Owner will be assigned to the work. The work of construction in all stages of progress shall be subject to the personal continuous observation of the Inspector. He/she shall have free access to any or all parts of the work at any time. The Contractor shall furnish the Inspector reasonable facilities for obtaining such information as may be necessary to keep him/her fully informed respecting the progress and manner of the work and character of the materials. Inspection of the work shall not relieve the Contractor from any obligation to fulfill this Contract.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 02 4100
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.

1.02 RELATED REQUIREMENTS

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

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

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

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards current edition.

1.04 PROJECT CONDITIONS

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

B. Comply with other requirements specified in Section 01 7000.

PART 3 EXECUTION

2.01 SCOPE

A. Remove paving and site improvements as indicated on drawings and as required to accomplish new work.

B. Remove items indicated within buildings, for replacement or new construction.

2.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with other requirements specified in Section 01 7000.

B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Comply with California Building Code Chapter 33 and California Fire Code Chapter 33.
   2. Obtain required permits.
   3. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   4. Provide, erect, and maintain temporary barriers and security devices.
   5. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   6. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   7. Do not close or obstruct roadways or sidewalks without permit.
   8. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
   9. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

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

D. Do not begin removal until built elements to be salvaged or relocated have been removed.

E. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.

3. Stop work immediately if adjacent structures appear to be in danger.

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

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

H. Perform demolition in a manner that maximizes salvage and recycling of materials.
1. Dismantle existing construction and separate materials.
2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

I. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

2.03 EXISTING UTILITIES

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

B. Protect existing utilities to remain from damage.

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

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

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

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

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

H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

2.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation only.
1. Contractor shall be responsible and shall pay for all services required for locating all existing underground utilities within the area of work.

B. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

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

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

E. Protect existing work to remain.
1. Perform cutting to accomplish removals neatly and as specified for cutting new work.
2. Repair adjacent construction and finishes damaged during removal work.

2.05 DEBRIS AND WASTE REMOVAL

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

B. Remove from site all materials not to be reused on site; do not burn or bury.

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

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

END OF SECTION

SECTION 05 5213
PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Ramp Handrails

1.02 REFERENCE STANDARDS

A. Title 24, Part 2, C.C.R., 2022 C.B.C.; Chapter 10 and Chapter 11.

B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2012.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2015.

D. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2013.

E. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings 2013.

F. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings 2000 (Reapproved 2006).

G. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic") 2002 (Ed. 2004).

1.03 SUBMITTALS

A. See Section 01 3010 - Submittals, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

PART 2 PRODUCTS

2.01 RAILINGS - GENERAL REQUIREMENTS

A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of ASTM E985 and applicable local code.

B. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.

C. Allow for expansion and contraction of members and building movement without damage to connections or members.

D. Dimensions: See drawings for configurations and heights.

E. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.

F. Provide welding fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

G. Railings and Handrails: CBC Section 11B-505:
   1. Top of gripping surfaces of handrails shall be 34" minimum and 38" maximum vertically above walking surfaces, stair nosings, and ramp surfaces. Handrails shall be at a consistent height above such surfaces.
   2. Clearance between handrail gripping surfaces and adjacent surfaces shall be 1-1/2" minimum. Handrail may be located in a recess if the recess is 3" maximum deep and 18" minimum clear above the top of the handrail.
   3. Handrail gripping surfaces shall be continuous along their length and shall not be obstructed along their tops or sides. The bottoms of handrail gripping surfaces shall not

be obstructed for more than 20% of their length. Where provided, horizontal projections shall occur 1-1/2" minimum below the bottom of the handrail gripping surfaces.

4. Handrail gripping surfaces with a circular cross section shall have an outside diameter of 1-1/4" minimum and 2" maximum.
5. Handrail gripping surfaces with a non-circular cross section shall have an outside dimension of 4" minimum and 6-1/4" maximum, and a cross-sectional dimension of 2-1/4" maximum.
6. Handrail gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive elements and shall have rounded edges.
7. Handrails shall not rotate within their fittings.
8. Handrail gripping surfaces shall extend beyond and in the same direction of stair flights and ramp runs in accordance with CBC Section 11B-505.10. Such extensions are not required for continuous handrails at the inside turn of switchback or dogleg stairs and ramps.
9. A 2" minimum high curb or barrier shall be provided to prevent the passage of a 4" diameter sphere rolling off the edges on a ramp or landing surface. Such a curb or barrier shall be continuous and uninterrupted along the length of a ramp. CBC Section 11B-405.9.2.

2.02 STEEL RAILING SYSTEM

A. Steel Pipe: Standard and XS Grade as indicated on drawings, galvanized finish.

B. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.

C. Straight Splice Connectors: Steel concealed spigots.

D. Galvanizing: In accordance with requirements of ASTM A123/A123M.
   1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic.

E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.03 FABRICATION

A. Accurately form components to suit specific project conditions and for proper connection to building structure.

B. Fit and shop assemble components in largest practical sizes for delivery to site.

C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.

D. Welded Joints:

E. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.

F. All welded joints and surfaces shall be ground smooth, no sharp or abrasive corners, edges or surfaces. Wall surfaces adjacent to handrail shall be smooth.

G. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be cast into concrete with setting templates, for installation as work of other sections.

3.03 INSTALLATION

A. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.

B. Anchor railings securely to structure.

C. Field weld anchors as indicated on shop drawings. Touch-up welds with primer. Grind welds smooth.

D. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

SECTION 06 1000
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural dimension lumber framing.

B. Non-structural dimension lumber framing.

C. Preservative treated wood materials.

D. Miscellaneous framing and sheathing.

E. Concealed wood blocking, nailers, and supports.

1.02 REFERENCE STANDARDS

A. 2022 California Building Code, Chapter 23.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2009.

C. AWPA U1 - Use Category System: User Specification for Treated Wood 2012.

D. PS 1 - Structural Plywood 2009.

E. PS 20 - American Softwood Lumber Standard 2010.

F. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17 2004, and supplements.

G. WWPA G-5 - Western Lumber Grading Rules 2011.

1.03 QUALITY ASSURANCE

A. Lumber: Comply with PS 20 and approved grading rules and inspection agencies.
   1. Acceptable Lumber Inspection Agencies: WCLB and WWPA.

B. Exposed-to-View Rough Carpentry: Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.

1.04 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. Species: Douglas Fir-Larch, unless otherwise indicated.
   2. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Lumber fabricated from old growth timber is not permitted.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Western Wood Products Association (WWPA).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Stud Framing (2 by 2 through 2 by 6):
   1. Species: Douglas Fir-Larch.
   2. Grade: No. 2.

E. Header Framing (2 by 6 through 4 by 16):
   1. Species: Douglas Fir-Larch.
   2. Grade: No. 1 & Btr.

F. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.

G. Miscellaneous Blocking, Furring, and Nailers:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Species: Douglas Fir-Larch.

2.03 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
   2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.

B. Die-Stamped Connectors: Hot dipped galvanized steel, sized to suit framing conditions.

C. Water-Resistive Barrier: No. 15 asphalt felt.

2.04 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft retention.
   1. Treat lumber in contact with roofing, flashing, or waterproofing.
   2. Treat lumber in contact with masonry or concrete.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.02 FRAMING INSTALLATION

A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.

B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.

C. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AFPA Wood Frame Construction Manual.

D. Provide Fire Blocks and Draft Stops per the 2022 California Building Code, Section 718.

E. Install horizontal spanning members with crown edge up and not less than 1-1/2 inches of bearing at each end.

F. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

3.03 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. Provide the following specific non-structural framing and blocking:
   1. Cabinets and shelf supports.
   2. Wall brackets.
   3. Handrails.
   4. Grab bars.
   5. Towel and bath accessories.
   6. Wall-mounted door stops.
   7. Chalkboards and marker boards.
   8. Wall paneling and trim.
   9. Joints of rigid wall coverings that occur between studs.
   10. Suspended ceiling perimeter angle locations.

3.04 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.05 CLEANING

A. Waste Disposal: Comply with the following requirements:

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06 4100
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Specially fabricated cabinet units.

B. Countertops.

C. Cabinet hardware.

1.02 REFERENCE STANDARDS

A. NEMA LD 3 - High-Pressure Decorative Laminates 2005.

B. ANSI A208.1 - American National Standard for Wood Particleboard; 2009.

C. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

D. PS 1 - Construction and Industrial Plywood; 2007.

E. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2005.

F. WI - North American Architectural Woodwork Standards - 3.0.

1.03 SUBMITTALS

A. See Section 01 3010 - Submittals, for submittal procedures.

B. Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location and schedule of finishes.
   1. Shop Drawings shall bear the "WIC Certified Compliance Label" on the first page of the drawings.

C. Product Data: Provide data for hardware accessories.

D. Samples: Hardware and laminate samples.

E. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

1.04 QUALITY ASSURANCE

A. ALL MILLWORK SHALL BE MANUFACTURED AND INSTALLED IN ACCORDANCE WITH THE STANDARDS IN THE NORTH AMERICAN ARCHITECTURAL WOODWORK STANDARDS OF THE WOODWORK INSTITUTE IN THE GRADE OR GRADES HEREINAFTER SPECIFIED OR SHOWN ON THE DRAWINGS.
   1. Perform work in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated Custom quality.
   2. Perform cabinet construction in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated Custom quality.
   3. Perform countertop construction in accordance with WI North American Architectural Woodwork Standards, Premium quality.

B. ADDITIONALLY, THE CSI THREE PART FORMATTED WI GUIDE SPECIFICATIONS LOCATED AT THE FRONT OF EACH WI PRODUCT SECTION SHALL BE REVIEWED AND INCLUDED AS APPLICABLE .

C. Furnish a WI Certified Compliance Certificate prior to delivery certifying that products meet all the requirements of the WI Grade specified.

D. Each elevation of casework shall bear the WI Certified Compliance Label.

E. After completion issue a WI Certified Compliance Certificate for Installation.

F. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

G. Manufacturer and Installer Qualifications: Member in good standing of the Woodwork Institutue .

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver all materials only when project is ready for installation and the general contractor has provided a clean storage area as defined in the Manual of Millwork.

PART 2 PRODUCTS

2.01 SEE WI "NORTH AMERICAN ARCHITECTURAL WOODWORK STANDARDS", SECTION 10 - CASEWORK - HPDL AND SECTION 11 - COUNTERTOPS - HPDL.

2.02 CABINETS

A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI//AWMAC/WI (AWS) for Custom Grade.

B. Cabinets:
   1. Finish - Exposed Exterior Surfaces: Decorative laminate.
   2. Door and Drawer Front Edge Profiles: Square edge with thin applied band.
   3. Casework Construction Type: Type A - Frameless.
   4. Cabinet Design Series: As indicated on drawings.
   5. Cabinet Style: Flush overlay.

2.03 LUMBER MATERIALS

A. Softwood Lumber: NIST PS 20; Graded in accordance with WI North American Architectural Woodwork Standards, Grade II/Custom; average moisture content of 4-9 percent.

2.04 PANEL MATERIALS

A. Softwood Plywood: NIST PS 1; Graded in accordance with WI North American Architectural Woodwork Standards, core materials of veneer, formaldehyde-free; species.

B. Wood Particleboard: NIST PS 1; WI North American Architectural Woodwork Standards, composed of wood chips, medium density, formaldehyde-free, made with moisture resistant; of grade to suit application; sanded faces.

2.05 LAMINATE MATERIALS

A. Manufacturers:
   1. Formica Corporation: www.formica.com.
   2. Panolam Industries International, Inc\Nevamar: www.nevamar.com.
   3. Wilsonart: www.wilsonart.com.

B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.

C. Plastic Laminate: WIC (MAN), 0.048 inch General Purpose quality; matte surface texture, color and pattern as selected by Architect from manufacturer's full standard color and pattern ranges.

D. Laminate Backing Sheet: NEMA LD 3 BK20 backing grade, undecorated plastic laminate.
   1. Semi-exposed surfaces shall be in accordance with WI North American Architectural Woodwork Standards requirements. Interior surfaces in open cabinets or behind glass doors shall be in accordance with WI Manual of Millwork requirements or match exposed surfaces.

2.06 COUNTERTOPS

A. Plastic Laminate Countertops: Medium density fiberboard substrate covered with HPDL, conventionally fabricated and self-edge banded.

2.07 ACCESSORIES

A. Adhesive: Type recommended by WI to suit application.

B. Fasteners: Size and type to suit application.

C. Concealed Joint Fasteners: Threaded steel.

2.08 COMPONENTS

A. Casework shall be WI North American Architectural Woodwork Standards Construction Style A - Frameless, WI Construction Type I - Multiple Self Supporting Units.

B. Casework numbers on the Plan or Elevation view reference the WI North American Architectural Woodwork Standards - Cabinet Design Series (CDS), cabinets are to be fabricated to the size indicated, as adjusted to fill the intended area.

C. Countertops shall be constructed with Self-Edge, unless indicated otherwise.

D. Backsplash shall be square butt joint with a square self-edge, 4" high off the deck surface, unless indicated otherwise.

E. Door and drawer front style shall be Flush Overlay and match WI North American Architectural Woodwork Standards door and drawer edge Type A.

F. Adjustable shelves shall be in accordance with WI North American Architectural Woodwork Standards requirements subject to a 50 pound per square foot uniformly spaced load not to exceed 200 pounds per shelf. Shelving thickness shall conform to the requirements of Table 16-9-1.

G. Adhesive used shall be Type I.

2.09 HARDWARE

A. Provide finish hardware for all casework included in the work of this section. Select cabinet hardware from WI "North American Architectural Woodwork Standards" most current listings of approved products; if not selected, shall be option of fabricator from this supplement. All cabinet hardware shall be installed by casework fabricator.
   1. Adjustable Shelf Standards and Clips: Provide adjustable shelf standards and clips per WI "North American Architectural Woodwork Standards" most current listings of approved products, Finish Hardware.
      a. Shelf supports shall be provided with metal ledge clips set in drilled holes spaced 32mm on center in two rows at each support.
      b. Adjustable Cabinet Shelf Supports (Pin Type) shall be equal to the following):
         1) "Hettich" #1005-767 (seismic).

B. Hardware:
   1. Drawer and Door Pulls: "U" shaped wire pull, aluminum with satin finish, 4 inch centers. CBC Section 11B-309.
   2. Sliding Door Pulls: Elongated shape for recessed installation, steel with satin finish.
   3. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with satin finish.
      a. Provide as indicated at locations shown on drawings for both doors and drawers.
   4. Catches: Magnetic.
   5. Drawer Slides: Galvanized steel construction, ball bearings separating tracks, full extension type.
   6. Hinges: Butt type, steel with satin finish Grade 1 as required for schools and hospitals.

C. Operable parts for all accessible casework shall comply with CBC Section 11B-309.

2.10 FABRICATION

A. Fabrication shall comply to First Class Workmanship, as defined by the Woodwork Institute, in their North American Architectural Woodwork Standards.

B. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

C. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

D. Cap exposed plastic laminate finish edges with material of same finish and pattern.

E. Door and Drawer Cores: 3/4" thick plywood.

F. Door and Drawer Fronts: 3/4 inch thick; overlay style.

G. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

H. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.

I. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.

J. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

PART 3 EXECUTION

3.01 CONSTRUCTION

A. Conform to the requirements of WI "North American Architectural Woodwork Standards," latest edition, for joinery requirements. Refer to included detail sheets for design criteria.

3.02 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify location and sizes of utility rough-in associated with work of this section.

3.03 INSTALLATION

A. Install work in this section as specified in WI "North American Architectural Woodwork Standards".
   1. Provide a WI Certified Compliance Certificate for installation at the completion of the project installation.

B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

C. Use fixture attachments in concealed locations for wall mounted components.

D. Use concealed joint fasteners to align and secure adjoining cabinet units.

E. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.

F. Secure cabinets to floor using appropriate angles and anchorages.

G. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.04 ADJUSTING

A. Adjust installed work.

B. Adjust moving or operating parts to function smoothly and correctly.

3.05 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

SECTION 07 2100
THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Batt insulation in interior partitions for acoustical attenuation.

1.02 REFERENCE STANDARDS

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

B. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C 2012.

1.03 FIELD CONDITIONS

A. Do no install insulation until building is weather tight.

B. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 APPLICATIONS

2.02 BATT INSULATION MATERIALS

A. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
   1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
   2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
   3. Combustibility: Non-combustible, when tested in accordance with ASTM E136.
   4. Acoustic Insulation: ASTM C 665; preformed glass fiber, friction fit tyoe, unfaced.
      a. Provide at perimeter of offices.
   5. Manufacturers:
      a. CertainTeed Corporation: www.certainteed.com/#sle.
      b. Johns Manville: www.jm.com/#sle.
      c. Owens Corning Corporation: www.ocbuildingspec.com.

2.03 ACCESSORIES

A. Nails or Staples: Steel wire; electroplated or galvanized; type and size to suit application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

3.02 BATT INSTALLATION

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

B. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

C. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

D. Staple or nail facing flanges in place at maximum 6 inches on center.

3.03 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07 9200
JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Self-leveling pourable joint sealants.

C. Joint backings and accessories.

1.02 REFERENCE STANDARDS

A. ASTM C834 - Standard Specification for Latex Sealants 2014.

B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2014.

C. ASTM C1193 - Standard Guide for Use of Joint Sealants 2013.

D. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness 2005 (Reapproved 2010).

E. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168 current edition.

1.03 SUBMITTALS

A. See Section 01 3010 - Submittals, for submittal procedures.

B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
   4. Substrates the product should not be used on.

C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

1.05 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal , exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 JOINT SEALANT APPLICATIONS

A. Scope:
   1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
      a. Wall expansion and control joints.
      b. Joints between door, window, and other frames and adjacent construction.
      c. Joints between different exposed materials.
   2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
      a. Joints between door, window, and other frames and adjacent construction.

3. Do not seal the following types of joints.
    a. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
    b. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
    c. Joints where installation of sealant is specified in another section.
    d. Joints between suspended panel ceilings/grid and walls.

B. Exterior Joints: Use nonsag polyurethane sealant, unless otherwise indicated.

C. Interior Joints: Use nonsag Acrylic emulsion latex sealant, unless otherwise indicated.
    1. Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant.

2.02 JOINT SEALANTS - GENERAL

A. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in South Coast Air Quality Management District (SCAQMD); Rule 1168.

2.03 NONSAG JOINT SEALANTS

A. Type 1 - Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.
    1. Movement Capability: Plus and minus 25 percent, minimum.

B. Type 2 - Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
    1. Color: Standard colors matching finished surfaces, Type OP (opaque).

2.04 SELF-LEVELING SEALANTS

A. Semi-Rigid Self-Leveling Polyurea Joint Filler: Two-component, 100 percent solids; Intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.
    1. Hardness: 75, Shore A, minimum, when tested in accordance with ASTM D2240 after 7 days.
    2. Color: Concrete gray.

2.05 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

D. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

D. Install bond breaker backing tape where backer rod cannot be used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

G. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

H. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

3.04 FIELD QUALITY CONTROL

A. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

END OF SECTION

SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Hollow metal frames for windows.

1.02 RELATED REQUIREMENTS

A. Section 09 9000 - Painting: Field painting.

1.03 REFERENCE STANDARDS

A. ANSI/SDI A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finish Coatings for Steel Doors and Frames 2007 (R2011).

B. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100) 2014.

C. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames 2011.

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2015.

E. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable 2015.

F. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2014.

G. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames 2014.

H. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames 2007.

1.04 SUBMITTALS

A. See Section 01 3010 - Submittals, for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

1.05 QUALITY ASSURANCE

A. Doors and frames shall conform to the requirements of ANSI A 250.8 (formally SDI-100), ANSI A 151.1, and other specifications herein named. Test reports shall be submitted upon request.

B. Acoustical qualities: Doors shall have a minimum sound transmission classification of 28 as tested under ASTM E 90 and ASTM E 413.

C. Insulation properties: Doors shall have a U factor 0.363 (R factor of 2.85) for honeycomb core, U factor for polystyrene core of .263 (R factor of 3.8), U factor for polyurethane core of 0.09 (R factor of 11.1).

D. Manufacturer Qualifications: Member of the Steel Door Institute, and National Association of Architectural Metal Manufacturers.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Handle, store and protect products in accordance with the manufacturers printed instructions and the provisions of ANSI A 250.8.

B. Store doors in an upright position under cover. Store products under cover on 4 inch (102 mm) high wood sills to prevent rust or damage. Provide 1/4-inch (6 mm) space between doors to

promote air circulation.

C. Store frames under cover on 4 inch (102 mm) high wood sills to prevent rust and damage. Assembled frames shall be stored in a vertical position, five units maximum in a stack. Provide 1/4-inch (6 mm) space between frames to promote air circulation.

D. Do not use non-vented plastic or canvas shelters.

E. Should wrappers become wet, remove immediately.

F. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

G. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

1.07 COORDINATION

A. Coordinate Work with other directly affected sections involving manufacture or fabrication of internal cutouts and reinforcement for door hardware, electric devices and recessed items.

B. Coordinate Work with frame opening construction, door and hardware installation.

C. Sequence installation to accommodate required door hardware.

D. Verify field dimensions for factory assembled frames prior to fabrication.

1.08 WARRANTY

A. See section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Submit written warranty on Manufacturer's standard form signed by an official of the door and frame manufacturer, agreeing to repair or replace any door and/or frame found defective within the warranty period. Hollow metal doors and frames shall be supplied with a one (1) year warranty against defects in materials and workmanship.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
   1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com.
   2. Republic Doors: www.republicdoor.com.
   3. Steelcraft, an Allegion Brand: www.steelcraft.com.
      a. Product: "B" Door
      b. Product: "F" Frame
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DESIGN CRITERIA

A. Requirements for Hollow Metal Doors and Frames:
   1. Steel used for fabrication of doors and frames shall comply with one or more of the following requirements; Galvannealed steel conforming to ASTM A653/A653M, cold-rolled steel conforming to ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel conforming to ASTM A1011/A1011M, Commercial Steel (CS) Type B for each.
   2. Accessibility: Comply with California Building Code, Chapter 11B.
   3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
   4. Door Edge Profile: Beveled, both sides.
   5. Typical Door Face Sheets: Flush.
   6. Hardware Preparation: In accordance with BHMA A156.115 and SDI-107, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
   7. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.

a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

8. Finish: Factory primed, for field finishing.

2.03 HOLLOW METAL DOORS

A. Exterior Doors: Thermally insulated.
   1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless, 16 gauge.
   2. Core Material: Polystyrene, 1 lbs/cu ft minimum density.
   3. Door Thickness: 1-3/4 inch, nominal.
   4. Top Closures for Outswinging Doors: Flush with top of faces and edges.
   5. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A60/ZF180 coating.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. General:
   1. Comply with the requirements of grade specified for corresponding door, except:
      a. ANSI A250.8 Level 3 Doors: 14 gauge frames.
      b. Frames for wood doors: Comply with frame requirements specified in ANSI A250.8 for Level 1, 16 gauge.
   2. Finish: Factory primed, for field finishing.

C. Exterior Door and Window Frames: Fully welded.
   1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A60/ZF180 coating.

2.05 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

2.06 ACCESSORIES

A. Glazing: As specified in Section 08 8000, factory installed.

B. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.

C. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.

D. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

2.07 FRAME ANCHORS

A. Provide sufficient anchorage to attach to wall in accordance with ANSI/SDI-119 Test Compliance Level A of one million cycles, or anchorage as detailed on plans to specific wall conditions.
   1. All anchors for frame attachment to wood construction: Lock-in stud anchors with #12 X 1-1/2" wood screws into framing.
   2. All frame jamb anchors to be provided: one each jamb per 30 Inches of frame height or fraction thereof. Furnish anchors at headers exceeding 48 Inches.

B. Floor anchors - angle type:
   1. Minimum 16 gage.
   2. To receive 2 fasteners per jamb.
   3. Welded to the bottom of each jamb.

2.08 HARDWARE PREPARATION

A. Reinforcements: reinforce components for hardware installation in accord with SDI-107 and ANSI-A115. Provide minimum gage hardware reinforcing for mortise or surface applied

hardware as follows:

1. Hinges - 10 gage or equivalent number of threads on doors.
2. Hinges - 7 gage on frames.
3. Locks - 12 gage or equivalent on threads.
4. Panics - 12 gage.
5. Surface Closer - 12 gage.
6. Hold Open Device - 12 gage.
7. Floor Check - 7 gage.

B. Punch single leaf frames to receive three (3) silencers. Double leaf frames to receive one silencer per leaf at head.

C. Factory prepared hardware locations to be in accord with "Recommended Locations for Builders' Hardware for Standard Steel Doors and Frames", as adopted by the Steel Door Institute.

2.09 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Coordinate frame anchor placement with wall construction.

C. Coordinate installation of hardware.

D. Coordinate installation of glazing.

E. Touch up damaged factory finishes.

3.03 SETTING FRAMES

A. Set frames in accord with SDI 105-91

B. Set welded frames in position prior to beginning partition work. Brace frames until permanent anchors are set.

C. Set anchors for frames as work progresses. Install anchors at hinge and strike levels.

D. Use temporary settings spreaders at all locations. Use intermediate spreaders to assure proper door clearances and header braces for grouted frames.

3.04 DOOR INSTALLATION

A. Install hollow metal doors in frames using hardware specified in Section 08710 Finish Hardware.

B. Install doors in accordance with manufacturer's instructions

C. Install doors accurately and squarely in frame, within clearances specified. Install hardware in accordance with manufacturer's written instruction ans associated templates. Refer to section 08710 for general installation requirements if specified.

D. Install doors to operate freely, but not loosely, free from hinge bound conditions, striking or binding. Do not install in frames that would hinder operation of doors. Hang free from rattling when in latched position.

E. Maximum clearances at edge of doors:

1. Between door and frame at heads and jambs: 1/8 inch.
2. At meeting edges pairs of doors and at mullions: 1/8 inch.
3. At transom panels, without transom bars: 1/8 inch.
4. At sills without thresholds: 5/8 inch max. Above finish floor.
5. At sills with thresholds: 1/8 inch above threshold.

F. Jobsite finishing to be completed on all six (6) sides of doors prior to installation of finish hardware, also finishing to include under the hinges and hardware cut-outs, as needed.

3.05 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified door and frame standards or custom guidelines indicated.

B. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.06 ADJUSTING & CLEANING

A. Adjust for smooth and balanced door movement.

B. Remove dirt and excess sealants, mortar or glazing compounds from exposed surfaces.

C. Adjust for smooth operation as required. Install shims as required to allow for proper closing.

D. Fill all dents, holes, and mounting bolts with metal filler and sand smooth and flush with adjacent surfaces- re-prime/paint to match finish.

E. Replace or rehang doors that are hinge bound and do not swing freely. Replace and rehang doors which are warped, twisted, or which are not in true plane.

F. Adjust door closers for full closure.

3.07 SCHEDULE

A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION

SECTION 08 1416
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flush wood doors; flush configuration; fire rated and non-rated.

1.02 RELATED REQUIREMENTS

A. Section 08 7100 - Door Hardware.

B. Section 09 9123 - Interior Painting: Field finishing of doors.

1.03 SUBMITTALS

A. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

1.06 WARRANTY

A. Interior Doors: Provide manufacturer's warranty for the life of the installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Medium Density Fiberboard Faced Doors for Opaque Finish:
   1. Eggers Industries: www.eggersindustries.com.
   2. Haley Brothers: www.haleybros.com.
   3. Marshfield DoorSystems, Inc: www.marshfielddoors.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DOORS

A. Doors: See drawings for locations and additional requirements.
   1. Quality Level: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS).

B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at each location.

2.03 DOOR AND PANEL CORES

A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.

2.04 DOOR FACINGS

A. Veneer Facing for Opaque Finish: Medium density fiberboard (MDF), in compliance with indicated quality standard.

2.05 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with stiles and rails:

C. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.

D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

1. Exception: Doors to be field finished.

F. Provide edge clearances in accordance with the quality standard specified.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 TOLERANCES

3.03 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

END OF SECTION

SECTION 08 7100
DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware for:

    a. Swinging doors.

2. Electronic access control system components, including:

    a. Electronic access control devices.

B. Exclusions: Unless specifically listed in hardware sets, hardware is not specified in this section for:

1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors
6. Installation.
7. Rough hardware.
8. Conduit, junction boxes & wiring.
9. Folding partitions, except cylinders where detailed.
10. Sliding aluminum doors, except cylinders where detailed.
11. Access doors and panels, except cylinders where detailed.

C. Related Sections:

1. Division 07 Section “Joint Sealants” for sealant requirements applicable to threshold installation specified in this section.
2. Division 09 sections for touchup finishing or refinishing of existing openings modified by this section.
3. Division 26 sections for connections to electrical power system and for low-voltage wiring.

1.3 REFERENCES

A. UL - Underwriters Laboratories

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies

3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. ANSI - American National Standards Institute

1. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties

C. California Code of Regulations

1. Title 24: California Building Standards Code

1.4 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 requirements.

B. Action Submittals:

1. Product Data: Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:

   a. Wiring Diagrams: For power, signal, and control wiring and including:
      1) Details of interface of electrified door hardware and building safety and security systems.
      2) Schematic diagram of systems that interface with electrified door hardware.
      3) Point-to-point wiring.
      4) Risers.

3. Samples for Verification: If requested by Architect, submit production sample or sample installations of each type of exposed hardware unit in finish indicated, and tagged with full description for coordination with schedule.

   a. Samples will be returned to supplier in like-new condition. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

4. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:

   a. Door Index; include door number, heading number, and Architects hardware set number.
   b. Opening Lock Function Spreadsheet: List locking device and function for each opening.
   c. Type, style, function, size, and finish of each hardware item.
   d. Name and manufacturer of each item.
   e. Fastenings and other pertinent information.
   f. Location of each hardware set cross-referenced to indications on Drawings.
   g. Explanation of all abbreviations, symbols, and codes contained in schedule.
   h. Mounting locations for hardware.
   i. Door and frame sizes and materials.

j. Name and phone number for local manufacturer's representative for each product.
k. Operational Description of openings with any electrified hardware (locks, exits, electromagnetic locks, electric strikes, automatic operators, door position switches, magnetic holders or closer/holder units, and access control components). Operational description should include how door will operate on egress, ingress, and fire and smoke alarm connection.
   1) Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work that is critical in Project construction schedule.

5. Key Schedule:

   a. Initiate and conduct meeting(s) with Owner representatives and hardware supplier to determine system keyway(s), keybow styles, structure, stamping, degree of physical security and degree of geographic exclusivity. Furnish Owner's written approval of the system; do not order keys or cylinders without written confirmation of actual requirements from the Owner.
   b. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system's function, key symbols used and door numbers controlled.
   c. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
   d. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
   e. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
   f. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
      1) Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.

6. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory prepared for door hardware installation.

C. Informational Submittals:

1. Qualification Data: For Supplier and Installer.
2. Product Certificates for electrified door hardware, signed by manufacturer:

   a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.

3. Certificates of Compliance:

   a. Electrified Hardware Coordination Conference Certification: Letter of compliance, signed by Contractor, attesting to completion of electrified hardware coordination conference, specified in "QUALITY ASSURANCE" article, herein.

4. Warranty: Special warranty specified in this Section.

D. Closeout Submittals:

1. Operations and Maintenance Data : Provide in accordance with Division 01 and include:

   a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.

b. Catalog pages for each product.
c. Name, address, and phone number of local representative for each manufacturer.
d. Final approved hardware schedule, edited to reflect conditions as-installed.
e. Final keying schedule
f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
g. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

1.5 QUALITY ASSURANCE

A. Product Substitutions: Comply with product requirements stated in Division 01 and as specified herein.

1. Where specific manufacturer's product is named and accompanied by "Owner Standard," including make or model number or other designation, provide product specified. (Note: Certain products have been selected for their unique characteristics and particular project suitability.)

a. Where no additional products or manufacturers are listed in product category, requirements for "Owner Standard" govern product selection.

2. Where products indicate "acceptable manufacturers" or "acceptable manufacturers and products", provide product from specified manufacturers, subject to compliance with specified requirements and "Single Source Responsibility" requirements stated herein.

B. Supplier Qualifications and Responsibilities: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project.

1. Scheduling Responsibility: Preparation of door hardware and keying schedules.
2. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
3. Coordination Responsibility: Coordinate installation of electronic security hardware with Architect and electrical engineers and provide installation and technical data to Architect and other related subcontractors.

a. Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.

C. Installer Qualifications: Qualified tradesmen, skilled in application of commercial grade hardware with record of successful in-service performance for installing door hardware similar in quantity, type, and quality to that indicated for this Project.

D. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated.
2. Manufacturers that perform electrical modifications and that are listed by testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

E. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

F. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.

1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.

G. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.

H. Means of Egress Doors: Latches do not require more than 5 lbs (67 N) to release latch. Locks do not require use of key, tool, or special knowledge for operation.

I. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in “REFERENCES” article, herein.

1. Provide operating devices that do not require tight grasping, pinching, or twisting of wrist and that operate with force of not more than 5 lbs (22.2 N).
2. Maximum opening-force requirements:

a. Interior, Non-Fire-Rated Hinged Doors: 5 lbs (22.2 N) applied perpendicular to door.
b. Sliding or Folding Doors: 5 lbs (22.2 N) applied parallel to door at latch.
c. Fire Doors: The minimum opening force allowable by the appropriate administrative authority, not to exceed 15 lbs (66.7N).

3. Bevel raised thresholds with slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.
4. Adjust closer so that the time required to move the door from the 90 degree position to 12 degrees from the latch is 5 seconds minimum.

J. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Inspect and discuss preparatory work performed by other trades.
3. Inspect and discuss electrical roughing-in for electrified door hardware.
4. Review sequence of operation for each type of electrified door hardware.
5. Review required testing, inspecting, and certifying procedures.

K. Coordination Conferences:

1. Installation Coordination Conference: Prior to hardware installation, schedule and hold meeting to review questions or concerns related to proper installation and adjustment of door hardware.

a. Attendees: Door hardware supplier, door hardware installer, Contractor.
b. After meeting, provide letter of compliance to Architect, indicating when meeting was held and who was in attendance.

2. Electrified Hardware Coordination Conference: Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

a. Attendees: electrified door hardware supplier, doors and frames supplier, electrified door hardware installer, electrical subcontractor, Owner, Owner’s security consultant, Architect and Contractor.
b. After meeting, provide letter of compliance to Architect, indicating when coordination conference was held and who was in attendance.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

1. Deliver each article of hardware in manufacturer's original packaging.

C. Project Conditions:

1. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
2. Provide secure lock-up for door hardware delivered to Project, but not yet installed. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

D. Protection and Damage:

1. Promptly replace products damaged during shipping.
2. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work.
3. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

E. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

1.7 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 03.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

E. Existing Openings:

1. Prior to submittal, carefully inspect existing conditions to verify finish hardware required to complete Work, including sizes, quantities, existing hardware scheduled for re-use, and sill condition material. If conflict between the specified/scheduled hardware and existing conditions, submit request for direction from Architect. Include date of jobsite visit in the submittal.
2. Submittals prepared without thorough jobsite visit by qualified hardware expert will be rejected as non-compliant.

F. Direct shipments not permitted, unless approved by Contractor.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Years from date of Substantial Completion, for durations indicated.

a. Closers:
1) Mechanical: 30 years.
2) Electrified: 2 years.

b. Exit Devices:
1) Mechanical: 3 years.
2) Electrified: 1 year.

c. Locksets:
1) Mechanical: 3 years.
2) Electrified: 1 year.

d. Continuous Hinges: Lifetime warranty.
e. Key Blanks: Lifetime

2. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.

1.9 MAINTENANCE

A. Maintenance Tools:

1. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

1.10 REGULATORY REQUIREMENTS:

A. Locate latching hardware between 34 inches to 44 inches above the finished floor, per 2022 California Building Code, Section 11B-404.2.7.

1. Panic hardware: locate between 36 inches to 44 inches above the finished floor.

B. Handles, pull, latches, locks, other operable parts:

1. Readily openable from egress side with one hand and without tight grasping, tight pinching, or twisting of the wrist to operate. 2022 California Building Code Section 11B-309.4.
2. Force required to activate the operable parts: 5.0 pounds maximum, per 2022 California Building Code Section 11B-309.4.

C. Adjust doors to open with not more than 5.0-pounds pressure to open at exterior doors and 5.0-pounds at interior doors. As allowed per 2022 California Building Code Section 11B-404.2.9, local authority may increase the allowable pressure for fire doors to achieve positive latching, but not to exceed 15-pounds.

1. Exception: exterior doors' pressure-to-open may be increased to 8.5-pounds if: at a single location, and one of a bank of eight leafs or fraction of eight, and one leaf of this bank is fitted with a low- or high-energy operator.

D. Low-energy powered doors: comply with ANSI/BHMA A156.19. Reference: 2022 California Building Code Section 11B-404.2.9, Exception 2.

1. Where powered door serves an occupancy of 150 or more, provide back-up battery power or stand-by generator power, capable of supporting a minimum of 100 cycles.
2. Actuators, vertical bar type: minimum 2-inches wide, 30-inches high, bottom located minimum 5-inches above floor or ground, top located minimum 35-inches above floor or ground. Displays International Symbol of Accessibility, per 2022 California Building Code Section 11B-703.7.
3. Actuators, plate type: use two at each side of the opening. Minimum 4-inches diameter or 4-inches square. Displays International Symbol of Accessibility, per 2022 California Building Code Section 11B-703.7. Locate centerline of lower plate between 7- and 8-inches above floor or ground, and upper plate between 30- and 44-inches above floor or ground.
4. Actuator location: conspicuously located, clear and level floor/ground space for forward or parallel approach.

E. Adjust door closer sweep periods so that from an open position of 90 degrees, the door will take at least 5 seconds to move to a point 12 degrees from the latch, measured to the landing side of the door, per 2022 California Building Code Section 11B-404.2.8.

1. Spring hinges: adjust for 1.5 seconds minimum for 70 degrees to fully-closed.

F. Smooth surfaces at bottom 10 inches of push sides of doors, facilitating push-open with wheelchair footrests, per 2022 California Building Code Section 11B-404.2.10.

1. Applied kickplates and armor plates: bevel the left and right edges; free of sharp or abrasive edges.
2. Tempered glass doors without stiles: bottom rail may be less than 10 inches if top leading edge is tapered 60 degrees minimum.

G. Door opening clear width no less than 32 inches, measured from face of frame stop, or edge of inactive leaf of pair of doors, to door face with door opened to 90 degrees. Hardware projection not a factor in clear width if located above 30 inches and below 80 inches, and the hardware projects no more than 4 inches. 2022 California Building Code Section 11B-404.2.3.

1. Exception: In alterations, a projection of 5/8 inch (15.9 mm) maximum into the required clear width shall be permitted for the latch side stop.
2. Door closers and overhead stops: not less than 78 inches above the finished floor or ground, per 2022 California Building Code 11B-307.4.

H. Thresholds: floor or landing no more than 0.50 inches below the top of the threshold of the doorway, per 2022 California Building Code Section 11B-404.2.5. Vertical rise no more than 0.25 inches, change in level between 0.25 inches and 0.50 inches: beveled to slope no greater than 1:2 (50 percent slope). 2022 California Building Code Section 11B-303.2 & ~.3.

I. Floor stops: Do not locate in path of travel. Locate no more than 4 inches from walls, per DSA Policy #99-08 (Access).

J. Pairs of doors with independently-activated hardware both leafs: limit swing of right-hand or right-hand-reverse leaf to 90 degrees to protect persons reading wall-mounted tactile signage, per 2022 California Building Code Section 11B-703.4.2.

K. Door and door hardware encroachment: Doors, when fully open, shall not reduce the required width by more than 7 inches. Doors in any position shall not reduce the required width by more than one-half. 2022 California Building Code, Section 1005.7.1.

1. In I-2 occupancies, surface mounted latch release hardware is not permitted to project in the required egress width, regardless of its mounting height, per 2022 California Building Code, Section 1005.7.1 at Exception 1.

L. In groups I-2 or I-2.1 occupancies, doors serving as a means of egress where used for the movement of beds and stretcher patients shall provide a minimum clear opening width of 44 inches. At pair openings that includes two door leaves without a mullion, one leaf shall provide a minimum clear opening width of 44 inches. 2022 California Building Code, Section 1010.1.1.

M. In group I-2 or I-2.1 occupancies, there shall be no projections into the clear width of doors used for the movement of beds and stretcher patients in the means of egress. 2022 California Building Code, Section 1010.1.1.1 at Exception 2.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Where “Owner Standard” is noted, submittals and substitution requests for other products will not be considered.

B. Approval of manufacturers and/or products other than those listed as “Scheduled Manufacturer” or “Acceptable Manufacturer” in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.

C. Approval of products from manufacturers indicated in “Acceptable Manufacturers” is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer’s product.

D. Hand of Door: Drawings show direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.

E. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.2 MATERIALS

A. Fasteners

1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.
4. Install hardware with fasteners provided by hardware manufacturer.

B. Modification and Preparation of Existing Doors: Where existing door hardware is indicated to be removed and reinstalled.

1. Provide necessary fillers, Dutchmen, reinforcements, and fasteners, compatible with existing materials, as required for mounting new opening hardware and to cover existing door and frame preparations.
2. Use materials which match materials of adjacent modified areas.
3. When modifying existing fire-rated openings, provide materials permitted by NFPA 80 as required to maintain fire-rating.

C. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

D. Cable and Connectors: Hardwired Electronic Access Control Lockset and Exit Device Trim:

1. Data: 24AWG, 4 conductor shielded, Belden 9843, 9841 or comparable.
2. DC Power: 18 AWG, 2 conductor, Belden 8760 or comparable.
3. Provide type of data and DC power cabling required by access control device manufacturer for this installation.

2.3 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Ives 5BB series
2. Acceptable Manufacturers and Products: Hager BB series, McKinney TA/T4A series, Stanley FBB Series

B. Requirements:

1. Provide five-knuckle ball bearing hinges conforming to ANSI/BHMA A156.1.
2. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:

    a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
    b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high

3. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:

    a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
    b. Interior: Heavy weight, steel, 5 inches (127 mm) high

4. 2 inches or thicker doors:

    a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
    b. Interior: Heavy weight, steel, 5 inches (127 mm) high

5. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
6. Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.
7. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

    a. Steel Hinges: Steel pins
    b. Non-Ferrous Hinges: Stainless steel pins
    c. Out-Swinging Exterior Doors: Non-removable pins
    d. Out-Swinging Interior Lockable Doors: Non-removable pins
    e. Interior Non-lockable Doors: Non-rising pins

8. Width of hinges: 4-1/2 inches (114 mm) at 1-3/4 inch (44 mm) thick doors, and 5 inches (127 mm) at 2 inches (51 mm) or thicker doors. Adjust hinge width as required for door, frame, and wall conditions to allow proper degree of opening.
9. Doors 36 inches (914 mm) wide or less furnish hinges 4-1/2 inches (114 mm) high; doors greater than 36 inches (914 mm) wide furnish hinges 5 inches (127 mm) high, heavy weight or standard weight as specified.
10. Provide hinges with electrified options as scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component.
11. Provide mortar guard for each electrified hinge specified.
12. Provide spring hinges where specified. Provide two spring hinges and one bearing hinge per door leaf for doors 90 inches (2286 mm) or less in height. Provide one additional bearing hinge for each 30 inches (762 mm) of additional door height.

2.4 CONTINUOUS HINGES

A. Stainless Steel

1. Manufacturers:

a. Scheduled Manufacturer: Ives
b. Acceptable Manufacturers: Hager

2. Requirements:

a. Provide pin and barrel continuous hinges conforming to ANSI/BHMA A156.26, Grade 2.
b. Provide pin and barrel continuous hinges fabricated from 14 gauge, type 304 stainless steel.
c. Provide twin self-lubricated nylon bearings at each hinge knuckle, with 0.25-inch (6 mm) diameter stainless steel pin.
d. Provide hinges capable of supporting door weights up to 600 pounds, and successfully tested for 1,500,000 cycles.
e. On fire-rated doors, provide pin and barrel continuous hinges that are classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
f. Provide pin and barrel continuous hinges with electrified options as scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware.
g. Install hinges with fasteners supplied by manufacturer.
h. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

2.5 ELECTRIC POWER TRANSFER

A. Manufacturers:

a. Scheduled Manufacturer: Von Duprin EPT-10

B. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires sufficient to accommodate electric function of specified hardware.

C. Locate electric power transfer per manufacturer’s template and UL requirements, unless interference with operation of door or other hardware items.

2.6 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Von Duprin 99/33 series
2. Acceptable Manufacturers and Products: Owner Standard

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1, and UL listed for Panic Exit or Fire Exit Hardware. Cylinders: Refer to “KEYING” article, herein.
2. Provide touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
3. Touchpad: Extend minimum of one half of door width. Match exit device finish, stainless steel for US26, US26D, US28, US32, and US32D finishes; and for all other finishes, provide compatible finish to exit device. No plastic inserts are allowed in touchpads.
4. Provide exit devices with dead-latching feature for security and for future addition of alarm kits and/or other electrified requirements.
5. Provide flush end caps for exit devices.
6. Provide exit devices with manufacturer’s approved strikes.
7. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
8. Mount mechanism case flush on face of doors, or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
9. Provide cylinder dogging at non-fire-rated exit devices.
10. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
11. Where lever handles are specified as outside trim for exit devices, provide heavy-duty lever trims with forged or cast escutcheon plates. Provide vandal-resistant levers that will travel to 90-degree down position when more than 35 pounds of torque are applied, and which can easily be re-set.

    a. Lever Style: Match lever style of locksets.
    b. Tactile Warning (Knurling): Where required by authority having jurisdiction. Provide on levers on exterior (secure side) of doors serving rooms considered to be hazardous.

12. Accessibility: Maximum 5lbs force to retract latch bolt per CBC Chapter 11B.

    “AX” feature: touchpad directly retracts the latchbolt with 5 lb or less of force. Provide testing lab certification confirming that the mechanical device is independent third-party tested to meet this 5 lb requirement.

13. Provide UL labeled fire exit hardware for fire rated openings.
14. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
15. Provide electrified options as scheduled.

2.7 ELECTRIC STRIKES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Von Duprin 6000 series

B. Requirements:

1. Provide electric strikes designed for use with type of locks shown at each opening.
2. Provide electric strikes UL Listed as burglary-resistant.
3. Where required, provide electric strikes UL Listed for fire doors and frames.
4. Provide fail-secure type electric strikes, unless specified otherwise.
5. Coordinate voltage and provide transformers and rectifiers for each strike as required.

2.8 POWER SUPPLIES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Schlage or Von Duprin PS900 series
2. Acceptable Manufacturers and Products: Precision ELR series, Sargent 3500 series, Dynalock 5000 series, Securitron BPS series, Security Door Controls 600 series

B. Requirements:

1. Provide power supplies, recommended and approved by manufacturer of electrified locking component, for operation of electrified locks, electrified exit devices, magnetic locks, electric strikes, and other components requiring power supply.
2. Provide appropriate quantity of power supplies necessary for proper operation of electrified locking components as recommended by manufacturer of electrified locking components with consideration for each electrified component using power supply, location of power supply, and approved wiring diagrams. Locate power supplies as directed by Architect.
3. Provide regulated and filtered 24 VDC power supply , and UL class 2 listed.
4. Options:

    a. Provide power supply, where specified, with internal capability of charging sealed backup batteries 24 VDC, in addition to operating DC load.
    b. Provide sealed batteries for battery back-up at each power supply where specified.
    c. Provide keyed power supply cabinet.

5. Provide power supply in an enclosure, complete, and requiring 120VAC to fused input.
6. Provide power supply with emergency release terminals, where specified, that allow release of all devices upon activation of fire alarm system complete with fire alarm input for initiating “no delay” exiting mode.

2.9 CYLINDERS

A. Manufacturers:

1. Scheduled Manufacturer: Schlage
2. Acceptable Manufacturers: Owner Standard

B. Requirements:

1. Provide interchangeable cylinders/cores to match Owner’s existing key system, compliant with ANSI/BHMA A156.5; latest revision, Section 12, Grade 1; permanent cylinders; cylinder face finished to match lockset, manufacturer’s series as indicated. Refer to “KEYING” article, herein.
2. Replaceable Construction Cores.

    a. Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
        1) 3 construction control keys
        2) 12 construction change (day) keys.

b. Owner or Owner's Representative will replace temporary construction cores with permanent cores.

2.10 KEYING

A. Provide a factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Provide cylinders/cores keyed into Owner's existing factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

C. Requirements:

1. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.

   a. Master Keying system as directed by the Owner.

2. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements shall be cause for replacement of cylinders/cores involved at no additional cost to Owner.
3. Provide keys with the following features:

   a. Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
   b. Patent Protection: Keys and blanks protected by one or more utility patent(s) until the year, 2029.

4. Identification:

   a. Mark permanent cylinders/cores and keys with applicable blind code per DHI publication "Keying Systems and Nomenclature" for identification. Blind code marks shall not include actual key cuts.
   b. Identification stamping provisions must be approved by the Architect and Owner.
   c. Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
   d. Failure to comply with stamping requirements shall be cause for replacement of keys involved at no additional cost to Owner.
   e. Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.

5. Quantity: Furnish in the following quantities.

   a. Change (Day) Keys: 3 per cylinder/core.
   b. Permanent Control Keys: 3.
   c. Master Keys: 6.

2.11 KEY CONTROL SYSTEM

A. Manufacturers:

1. Scheduled Manufacturer: Telkee
2. Acceptable Manufacturers: HPC, Lund

B. Requirements:

1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.

    a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
    b. Provide hinged-panel type cabinet for wall mounting.

2.12 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: LCN 4040XP series.
2. Acceptable Manufacturers and Products: Owner Standard.

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Cylinder Body: 1-1/2-inch (38 mm) diameter piston with 5/8-inch (16 mm) diameter double heat-treated pinion journal. QR code with a direct link to maintenance instructions.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards. Provide snap-on cover clip, with plastic covers, that secures cover to spring tube.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck. Provide graphically labelled instructions on the closer body adjacent to each adjustment valve. Provide positive stop on reg valve that prevents reg screw from being backed out.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.13 DOOR TRIM

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Rockwood, Trimco

B. Requirements:

1. Provide push plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick and beveled 4 edges. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.

2. Provide push bars of solid bar stock, diameter and length as scheduled. Provide push bars of sufficient length to span from center to center of each stile. Where required, mount back to back with pull.
3. Provide offset pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
4. Provide flush pulls as scheduled. Where required, provide back-to-back mounted model.
5. Provide pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
6. Provide pull plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick, beveled 4 edges, and prepped for pull. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
7. Provide wire pulls of solid bar stock, diameter and length as scheduled.
8. Provide decorative pulls as scheduled. Where required, mount back to back with pull.

2.14 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Rockwood, Trimco

B. Requirements:

1. Provide kick plates, mop plates, and armor plates minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes of plates:

   a. Kick Plates: 10 inches (254 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
   b. Mop Plates: 4 inches (102 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
   c. Armor Plates: 36 inches (914 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs

2.15 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Rockwood, Trimco

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
2. Where a wall stop cannot be used, provide universal floor stops for low or high rise options.
3. Where wall or floor stop cannot be used, provide medium duty surface mounted overhead stop.

2.16 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer: Zero International

2. Acceptable Manufacturers: National Guard, Pemko

B. Requirements:

1. Provide thresholds, weather-stripping (including door sweeps, seals, and astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.
2. Size of thresholds:

a. Saddle Thresholds: 1/2 inch (13 mm) high by jamb width by door width
b. Bumper Seal Thresholds: 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width

3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.

2.17 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Rockwood, Trimco

B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

2.18 FINISHES

A. Finish: BHMA 626/652 (US26D); except:

1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Continuous Hinges: BHMA 630 (US32D)
3. Continuous Hinges: BHMA 628 (US28)
4. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
5. Protection Plates: BHMA 630 (US32D)
6. Overhead Stops and Holders: BHMA 630 (US32D)
7. Door Closers: Powder Coat to Match
8. Wall Stops: BHMA 630 (US32D)
9. Latch Protectors: BHMA 630 (US32D)
10. Weatherstripping: Clear Anodized Aluminum
11. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

D. Existing frames and doors to be retrofitted with new hardware:

1. Field-verify conditions and dimensions prior to ordering hardware. Fill existing hardware cut outs not being reused by the new hardware. Remove existing hardware not being reused, return to Owner unless directed otherwise.
2. Remove existing floor closers not scheduled for reuse, fill cavities with non-shrinking concrete and finish smooth.
3. Cut and weld existing steel frames currently prepared with 2.25 inch height strikes. Cut an approximate 8 inch section from the strike jamb and weld in a reinforced section to accommodate specified hardware's strike.
4. Provide wrap-around repair plates at doors where required to cover the original preparation and allow installation of new hardware.

3.2 PREPARATION

A. Where on-site modification of doors and frames is required:

1. Carefully remove existing door hardware and components being reused. Clean, protect, tag, and store in accordance with storage and handling requirements specified herein.
2. Field modify and prepare existing door and frame for new hardware being installed.
3. When modifications are exposed to view, use concealed fasteners, when possible.
4. Prepare hardware locations and reinstall in accordance with installation requirements for new door hardware and with:

a. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
b. Wood Doors: DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."
c. Doors in rated assemblies: NFPA 80 for restrictions on on-site door hardware preparation.

3.3 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Custom Steel Doors and Frames: HMMA 831.
3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.

C. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.

D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

F. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.

G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

H. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as indicated in keying section.

I. Wiring: Coordinate with Division 26, ELECTRICAL sections for:

1. Conduit, junction boxes and wire pulls.
2. Connections to and from power supplies to electrified hardware.
3. Connections to fire/smoke alarm system and smoke evacuation system.
4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
5. Testing and labeling wires with Architect's opening number.

J. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

K. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers shall not be visible in corridors, lobbies and other public spaces unless approved by Architect.

L. Closer/Holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

M. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.

1. Coordination: Coordinate provision with the security systems provider to mitigate excessive or redundant purchase.
2. Configuration: Provide least number of power supplies required to adequately serve doors with electrified door hardware.

N. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."

O. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.

P. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

Q. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

R. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

S. Field-verify existing conditions and measurements prior to ordering hardware. Fill existing hardware cut outs not being used by the new hardware.

T. Remove existing hardware not being reused. Tag and bag removed hardware, turn over to Owner.

U. Where existing wall conditions will not allow door to swing using the scheduled hinges, provide wide-throw hinges and if needed, extended arms on closers.

V. Provide manufacturer's recommended brackets to accommodate the mounting of closers on doors with flush transoms.

3.4 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three months after date of Substantial Completion, Installer shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.5 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.6 DEMONSTRATION

A. Provide training for Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Division 01 Section "Demonstration and Training."

3.7 DOOR HARDWARE SCHEDULE

A. Locksets, exit devices, and other hardware items are referenced in the following hardware sets for series, type and function. Refer to the above-specifications for special features, options, cylinders/keying, and other requirements.

B. Do not order material until submittal has been reviewed, stamped, and signed by Architect’s door hardware consultant.

C. Hardware Sets:

Hardware Group No. 1

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	700 EPT		630	IVE
1	EA	PANIC HARDWARE	LD-PA-AX-99-NL-OP-110MD		626	VON
1	EA	RIM CYLINDER	20-057 ICX		626	SCH
1	EA	FSIC FINAL CORE	MATCH CAMPUS STANDARD		626	SCH
1	EA	ELECTRIC STRIKE	6300 FSE 12/24 VAC/VDC		630	VON
1	EA	DOOR PULL	VR910 NL SNB		630	IVE
1	EA	SURFACE CLOSER	4040XP EDA		689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA (AS REQ)		689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 (AS REQ)		689	LCN
1	EA	BLADE STOP SPACER	4040XP-61 (AS REQ)		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	FLOOR STOP	FS18S		BLK	IVE
1		SEALS	BY ALUMINUM FRAME MANUFACTURER			B/O
1	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	102A-E (OR PER SILL DETAIL)		A	ZER
1	EA	* CREDENTIAL READER	BY SECURITY CONTRACTOR			AIP
1	EA	* DOOR CONTACT	BY SECURITY CONTRACTOR		BLK	
1	EA	*POWER SUPPLY	BY SECURITY CONTRACTOR			VON

WIDE STILE DOOR REQUIRED TO INSTALL SPECIFIED HARDWARE.
* = BY ACCESS CONTROL CONTRACTOR. (SHOWN HERE FOR COORDINATION AND TEMPLATING PURPOSES)
CONDUIT, JUNCTION BOXES BY ELECTRICAL CONTRACTOR.
CARD READER, LOW VOLTAGE WIRING AND CONNECTIONS BY SECURITY CONTRACTOR.

DOOR NORMALLY CLOSED AND LOCKED. PRESENTING VALID CREDENTIALS TO THE READER WILL MOMENTARILY UNLOCK THE DOOR, ALLOWING ACCESS. DOOR LOCKS ONCE THE DOOR CLOSES. DOOR LOCK STATUS CAN BE SET ACCORDING TO SCHEDULE IN ACCESS CONTROL SOFTWARE. DOOR CAN BE REMOTELY LOCKED VIA ACCESS CONTROL SYSTEM. FREE EGRESS AT ALL TIMES. UPON LOSS OF POWER, THE DOOR WILL REMAIN LOCKED AND WILL CONTINUE TO ALLOW FREE EGRESS.

Hardware Group No. 2

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	700 EPT		630	IVE
2	EA	POWER TRANSFER	EPT-10		689	VON
1	EA	REMOVABLE MULLION	KR4954		689	VON
1	EA	ELEC PANIC HARDWARE	RX-QELX-PA-AX-99-EO		626	VON
1	EA	ELEC PANIC HARDWARE	RX-QELX-PA-AX-99-NL-OP-110MD		626	VON
1	EA	MULLION STORAGE KIT	MT54		689	VON
1	EA	RIM CYLINDER	20-057 ICX		626	SCH
1	EA	MORTISE CYLINDER	20-061 ICX (MULLION)		626	SCH
2	EA	FSIC FINAL CORE	MATCH CAMPUS STANDARD		626	SCH
1	EA	DOOR PULL	VR910 DT SNB		630	IVE
1	EA	DOOR PULL	VR910 NL SNB		630	IVE
2	EA	SURFACE CLOSER	4040XP EDA		689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA (AS REQ)		689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 (AS REQ)		689	LCN
1	EA	BLADE STOP SPACER	4040XP-61 (AS REQ)		689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
2	EA	FLOOR STOP	FS18S		BLK	IVE
1	EA	* CREDENTIAL READER	BY SECURITY CONTRACTOR			AIP
2	EA	* DOOR CONTACT	BY SECURITY CONTRACTOR		BLK	
1	EA	POWER SUPPLY	BY SECURITY CONTRACTOR			VON

WIDE STILE DOOR REQUIRED TO INSTALL SPECIFIED HARDWARE.
* = BY ACCESS CONTROL CONTRACTOR. (SHOWN HERE FOR COORDINATION AND TEMPLATING PURPOSES)
CONDUIT, JUNCTION BOXES BY ELECTRICAL CONTRACTOR.
CARD READER, LOW VOLTAGE WIRING AND CONNECTIONS BY SECURITY CONTRACTOR.

DOOR NORMALLY CLOSED AND LOCKED. PRESENTING VALID CREDENTIALS TO THE READER WILL MOMENTARILY UNLOCK THE DOOR, ALLOWING ACCESS. DOOR LOCKS ONCE THE DOOR CLOSES. DOOR LOCK STATUS CAN BE SET ACCORDING TO SCHEDULE IN ACCESS CONTROL SOFTWARE. DOOR CAN BE REMOTELY LOCKED VIA ACCESS CONTROL SYSTEM. FREE EGRESS AT ALL TIMES. UPON LOSS OF POWER, THE DOOR WILL REMAIN LOCKED AND WILL CONTINUE TO ALLOW FREE EGRESS.

Hardware Group No. 3

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	OFFICE/ENTRY LOCK	L9050T 17A 09-544		626	SCH
1	EA	FSIC CORE	MATCH CAMPUS STANDARD		626	SCH
1	EA	WALL STOP	WS406/407CVX		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

End of Section

SECTION 08 8000
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass.

B. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

A. Section 08 1113 - Hollow Metal Doors and Frames: Glazed windows.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials current edition.

B. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers 2005 (Reapproved 2011).

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2014.

D. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass 2012.

E. ASTM C1193 - Standard Guide for Use of Joint Sealants 2013.

F. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation 2010.

G. GANA (GM) - GANA Glazing Manual 2009.

H. GANA (SM) - GANA Sealant Manual 2008.

1.04 SUBMITTALS

A. See Section 01 3010 - Submittals, for submittal requirements.

B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual for glazing installation methods. Maintain one copy on site.

B. Comply with the requirements of CBC Chapter 24.

1.06 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 50 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Sealed Insulating Glass Units: Provide a five (5) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.

PART 2 PRODUCTS

2.01 INSULATING GLASS UNITS

A. Type IG-1 - Sealed Insulating Glass Units: Vision glass, double glazed.
   1. Application: All exterior glazing unless otherwise indicated.
   2. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
      a. Tint: Match existing glazing on site.
      b. Coating: Low-E (passive type), on #2 surface.

3. Inboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
   a. Tint: Clear.
4. Total Thickness: 1 inch.

2.02 EXTERIOR GLAZING ASSEMBLIES

A. Performance Criteria: Select type and thickness of glass to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of glass.
   1. Glass thicknesses listed are minimum.

2.03 GLASS MATERIALS

A. Float Glass Manufacturers:
   1. AGC Flat Glass North America, Inc: www.na.agc-flatglass.com.
   2. Guardian Industries Corp: www.sunguardglass.com.
   3. PPG Industries, Inc: www.ppgideascapes.com.
   4. Substitutions: Refer to Section 01 6000 - Product Requirements.

B. Float Glass: Provide float glass based glazing unless noted otherwise.
   1. Heat-Strengthened and Fully Tempered Types: ASTM C1048, Kind HS and Kind FT.
   2. Thicknesses: As indicated; for exterior glazing comply with requirements indicated for wind load design regardless of thickness indicated.

2.04 SEALED INSULATING GLASS UNITS

A. Sealed Insulating Glass Units: Types as indicated.
   1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
   2. Edge Spacers: Aluminum, bent and soldered corners.
   3. Edge Seal: Glass to elastomer.
   4. Purge interpane space with dry hermetic air.

2.05 GLAZING COMPOUNDS

A. Butyl Sealant: Single componentASTM C 920, Grade NS, Class 12-1/2, Uses M and A;, Shore A hardness of 10 to 20; black color.

B. Acrylic Sealant : Single component, solvent curing, non-bleeding; ASTM C 920, Type S, Grade NS, Class 12-1/2, Uses M and A; cured Shore A hardness of 15 to 25; color as selected.

2.06 GLAZING ACCESSORIES

A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness; ASTM C864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option I. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; hardness range of 5 to 30 cured Shore A durometer; coiled on release paper; black color.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

D. Install sealants in accordance with ASTM C1193 and GANA Sealant Manual.

E. Install sealants in accordance with manufacturer's instructions.

3.03 GLAZING METHODS

3.04 INSTALLATION - EXTERIOR WET/DRY METHOD (PREFORMED TAPE AND SEALANT)

A. Cut glazing tape to length and set against permanent stops, 3/16 inch below sight line. Seal corners by butting tape and dabbing with butyl sealant.

B. Apply heel bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete the continuity of the air and vapor seal.

C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

D. Rest glazing on setting blocks and push against tape and heel bead of sealant with sufficient pressure to attain full contact at perimeter of pane or glass unit.

E. Install removable stops, with spacer strips inserted between glazing and applied stops 1/4 inch below sight lines.
   1. Place glazing tape on glazing pane of unit with tape flush with sight line.

F. Fill gap between glazing and stop with silicone type sealant to depth equal to bite of frame on glazing, but not more than 3/8 inch below sight line.

G. Apply cap bead of silicone type sealant along void between the stop and the glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.05 CLEANING

A. Remove glazing materials from finish surfaces.

B. Remove labels after Work is complete.

C. Clean glass and adjacent surfaces.

3.06 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste.

END OF SECTION

SECTION 09 2116
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Gypsum wallboard.

B. Joint treatment and accessories.

C. Textured finish system.

1.02 REFERENCE STANDARDS

A. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board 2015.

B. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board 2013.

C. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs 2014.

D. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base 2014a.

E. GA-216 - Application and Finishing of Gypsum Board 2013.

1.03 SUBMITTALS

A. See Section 01 3010 - Submittals, for submittal procedures.

B. Product Data: Provide data on gypsum board, accessories, and joint finishing system.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

2.02 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
   1. Georgia-Pacific Gypsum; www.gpgypsum.com
   2. National Gypsum Company; www.nationalgypsum.com
   3. USG Corporation; www.usg.com
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces, unless otherwise indicated.
   2. Thickness:
      a. Vertical Surfaces: 5/8 inch.

2.03 ACCESSORIES

A. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
   1. Types: As detailed or required for finished appearance.
   2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.

B. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
   1. Tape: 2 inch wide, creased paper tape for joints and corners.
   2. Ready-mixed vinyl-based joint compound.

C. Textured Finish Materials: Latex-based compound; plain.

D. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 BOARD INSTALLATION

A. Comply with ASTM C 840, GA-216, ASTM C 840, GA-216, ASTM C 840, and GA-216. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

3.03 INSTALLATION OF TRIM AND ACCESSORIES

A. Corner Beads: Install at external corners, using longest practical lengths.

B. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.04 JOINT TREATMENT

A. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.

B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   2. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
   3. Level 3: Walls to receive textured wall finish.
   4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.

C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.

D. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.05 TEXTURE FINISH

A. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions and to match approved sample.

3.06 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 09 5100
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.02 REFERENCE STANDARDS

A. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings 2013a.

B. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels 2013.

C. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions 2014.

D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products 2014.

1.03 ADMINISTRATIVE REQUIREMENTS

A. California State Structural Safety Interpretive Manual; IR No. 25-2.13, "Metal Suspension Systems for Lay-In Panel Celings".

B. Title 24, Part 2, C.C.R., 2022 C.B.C. (2021 I.B.C. w/ California Amendments); Section 2506.2.1.

C. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

D. Do not install acoustical units until after interior wet work is dry.

1.04 SUBMITTALS

A. See Section 01 3010 - Submittal, for submittal procedures.

B. Product Data: Provide data on suspension system components and acoustical units.

1.05 QUALITY ASSURANCE

A. Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.

B. Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
   1. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 for Class A products.
      a. Flame Spread: 25 or less
      b. Smoke Developed: 50 or less

C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.06 FIELD CONDITIONS

A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.

B. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 ACOUSTICAL UNITS

A. Manufacturers:
   1. Armstrong World Industries, Inc: www.armstrong.com.
   2. CertainTeed Corporation: www.certainteed.com.

3. USG: www.usg.com.
4. Substitutions: See Section 01 6000 - Product Requirements.

B. Acoustical Units - General: ASTM E1264, Class A.
1. Manufacturer: Armstrong or equal.

C. Acoustical Panel -Type General Use: Wet-formed mineral fiber, ASTM E 1264 Type III, with the following characteristics:
1. Size: 24 x 48 inches (600 x 1200 mm).
2. Thickness: 5/8 inches.
3. Composition: Wet felted.
4. Light Reflectance: 80 percent, determined as specified in ASTM E 1477.
5. Edge: Square.
6. Surface Color: White.
7. Surface Pattern: Non-directional fissured.
8. Products: Cortega 769 by Armstrong World Industries, Inc.

2.02 SUSPENSION SYSTEM(S)

A. Manufacturers:
1. Armstrong World Industries, Inc; Product Prelude and Prelude Plus Systems: www.armstrong.com.
2. Chicago Metallic Corporation; Product 660 and 730 Systems: www.chicagometallic.com.
3. USG; Product DX and ZXA Systems: www.usg.com.
4. Substitutions: See Section 01 6000 - Product Requirements.

B. Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.
1. Manufacturer: Armstrong or equal.

C. Components: All main beams and cross tees shall be commercial quality hot-dipped galvanized (galvanized steel, aluminum, or stainless steel) as per ASTM A 653. Main beams and cross tees are double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping pre-finished galvanized steel (aluminum or stainless steel) in baked polyester paint. Main beams and cross tees shall have rotary stitching (exception: extruded aluminum or stainless steel).

D. ExposedSteel Suspension System: Formed steel, commercial quality cold rolled; heavy-duty.
1. Profile: Tee; 15/16 inch wide face.
2. Construction: Double web.
3. Finish: White painted.

E. Suspension system shall meet DSA Product Acceptance Documents.

2.03 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

B. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least time three design load, but not less than 12 gauge.

C. Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations, including light fixtures, that fit type of edge detail and suspension system indicated. Provide moldings with exposed flange of the same width as exposed runner.

D. Perimeter Moldings at Clouds: Same material and finish as grid.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

3.02 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with Title 24, Part 2 C.C.R., 2022 C.B.C., DSA IR 25-2.13, manufacturer's instructions and as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.

D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

E. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

I. Do not eccentrically load system or induce rotation of runners.

J. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.
   2. Overlap and rivet corners.

3.03 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install units after above-ceiling work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

F. Cutting Acoustical Units:
   1. Make field cut edges of same profile as factory edges.

3.04 ADJUSTING AND CLEANING

A. Replace damaged and broken panels.

B. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

3.05 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

SECTION 09 6500
RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient base.

B. Installation accessories.

1.02 REFERENCE STANDARDS

A. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source 2014c.

B. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring 2011.

C. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile 2004 (Reapproved 2014).

D. ASTM F1303 - Standard Specification for Sheet Vinyl Floor Covering with Backing 2004 (Reapproved 2014).

E. ASTM F1861 - Standard Specification for Resilient Wall Base 2008 (Reapproved 2012).

1.03 SUBMITTALS

A. See Section 01 3010 - Submittals, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store all materials off of the floor in an acclimatized, weather-tight space.

B. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

1.05 FIELD CONDITIONS

A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.01 RESILIENT BASE

A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove.
   1. Manufacturers:
      a. Johnsonite, a Tarkett Company
   2. Height: 6 inch.
   3. Thickness: 0.125 inch thick.
   4. Finish: Matte.
   5. Color: To be selected by Architect from manufacturer's full range.

2.02 ACCESSORIES

A. Adhesives: Waterproof; types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.

3.02 INSTALLATION

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

B. Spread only enough adhesive to permit installation of materials before initial set.

C. Fit joints and butt seams tightly.

3.03 RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.

B. Install base on solid backing. Bond tightly to wall and floor surfaces.

C. Scribe and fit to door frames and other interruptions.

3.04 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

END OF SECTION

SECTION 09 6816
SHEET CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Carpet, direct-glued.

1.02 REFERENCE STANDARDS

A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials 2006 (Reapproved 2011).

B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source 2014c.

C. CRI 104 - Standard for Installation of Commercial Carpet 2015.

D. CRI (CIS) - Carpet Installation Standard; Carpet and Rug Institute; 2009.

E. CRI (GLA) - Green Label Testing Program - Approved Adhesive Products; Carpet and Rug Institute; Current Edition.

F. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source 2015.

1.03 SUBMITTALS

A. See Section 01 3010 - Submittals, for submittal requirements.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

C. Samples: Submit two samples 12 by 12 inch in size illustrating color and pattern for each carpet and cushion material specified.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in installing carpet with minimum three years documented experience.

1.05 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.

B. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.

C. Ventilate installation area during installation and for 72 hours after installation.

PART 2 PRODUCTS

2.01 CARPET

A. Carpet: Tufted, nylon, direct glued, conforming to the following criteria:
   1. Manufacturer: Tarkett - Aftermath II.
   2. Size: 24" x 24" tiles.
   3. Color: Fleece 23508.
   4. Critical Radiant Flux: Minimum of 0.22 watts/sq cm, when tested in accordance with ASTM E648 or NFPA 253.
   5. Flame Resistance: Radiant Flooring Panel Class I ASTM E-648; Surface Flammability Passes CPSC FF 1-70.
   6. Surface Texture: Textured Pattern Loop.
   7. Yarn Content: Dynex SD, Dynex Nylon.
   8. Dye Method: 60% Solution Dyed, 40% Yarn Dyed.
   9. PIle Height Average: 0.117"
   10. Machine Gage: 1/13 inch.
   11. Stitches: 8.5 per inch.
   12. Cushion: Powerbond Cushion.

13. Total Weight: 81.0 oz/sq yd.

2.02 ACCESSORIES

A. Sub-Floor Filler: Type recommended by carpet manufacturer.

B. Adhesives - General: Compatible with materials being adhered; maximum VOC content of 50 g/L; CRI Green Label certified.

C. Seam Adhesive: Recommended by manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive carpet.

B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesives to sub floor surfaces.

3.02 PREPARATION

A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

B. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.

C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

D. Clean substrate.

3.03 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install carpet and cushion in accordance with manufacturer's instructions and CRI 104 (Commercial).

C. Verify carpet match before cutting to ensure minimal variation between dye lots.

D. Install carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.

E. Carpet shall be securely attached and shall have a firm cushion, pad, or backing or no cushion or pad. it shall have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. Pile height shall be 1/2" maximum. Provide glue down installation that complies with 2022 C.B.C., Chapter 11B.

F. Exposed edges shall be fastened to floor surfaces and shall have trim on the entire length. Carpet edges shall comply with CBC Section 11B-303.

3.04 DIRECT-GLUED CARPET

A. Double cut carpet seams, with accurate pattern match. Make cuts straight, true, and unfrayed. Apply seam adhesive to cut edges of woven carpet immediately.

B. Apply contact adhesive to floor uniformly at rate recommended by manufacturer. After sufficient open time, press carpet into adhesive.

C. Apply seam adhesive to the base of the edge glued down. Lay adjoining piece with seam straight, not overlapped or peaked, and free of gaps.

D. Roll with appropriate roller for complete contact of adhesive to carpet backing.

E. Trim carpet neatly at walls and around interruptions.

3.05 CLEANING

A. Remove excess adhesive from floor and wall surfaces without damage.

B. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 09 9000
PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
   1. Mechanical and Electrical:
      a. In finished areas, paint all insulated and exposed pipes, unless otherwise indicated.
      b. In finished areas, paint shop-primed items.
      c. Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.

D. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Stainless steel, anodized aluminum, bronze, terne, and lead items.
   6. Floors, unless specifically so indicated.
   7. Ceramic and other tiles.
   8. Brick, architectural concrete, cast stone, integrally colored plaster and stucco.
   9. Glass.
   10. Concealed pipes, ducts, and conduits.

1.02 REFERENCE STANDARDS

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

1.03 SUBMITTALS

A. See Section 01 3010 - Submittal, for submittal procedures.

B. Product Data: Provide complete list of all products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.

D. Certification: By manufacturer that all paints and coatings comply with VOC limits specified.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and

instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.06 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.

B. Paints:
   1. Base Manufacturer: Dunn Edwards.

C. Primer Sealers: Same manufacturer as top coats.

D. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
   1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Supply each coating material in quantity required to complete entire project's work from a single production run.
   3. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Volatile Organic Compound (VOC) Content:
   1. Provide coatings that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
   2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

D. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

E. Colors: To be selected from manufacturer's full range of available colors.
   1. Selection to be made by Architect after award of contract.
   2. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.

2.03 PAINT SYSTEMS - EXTERIOR

A. Paint GE-OP-3L - Gypsum Board and Plaster, Opaque, Latex, 3 Coat:

1. One coat of latex primer sealer.
2. Flat: Two coats of latex; Spartashield.

B. Paint ME-OP-3L - Ferrous Metals, Unprimed, Latex, 3 Coat:
1. One coat of latex primer, Bloc-Rust Primer.
2. Semi-gloss: Two coats of latex enamel; Spartashield.

C. Paint ME-OP-2L - Ferrous Metals, Primed, Latex, 2 Coat:
1. Touch-up with rust-inhibitive primer recommended by top coat manufacturer.
2. Semi-gloss: Two coats of latex enamel; Spartashield.

D. Paint MgE-OP-3L - Galvanized Metals, Latex, 3 Coat:
1. One coat galvanize primer. Ultra-Grip.
2. Semi-gloss: Two coats of latex enamel; Spartashield.

2.04 PAINT SYSTEMS - INTERIOR

A. Paint MI-OP-3L - Ferrous Metals, Unprimed, Latex, 3 Coat:
1. One coat of latex primer, Bloc-Rust Premium.
2. Semi-gloss: Two coats of latex enamel; Spartawall.

B. Paint MI-OP-2L - Ferrous Metals, Primed, Latex, 2 Coat:
1. Touch-up with latex primer.
2. Semi-gloss: Two coats of latex enamel; Spartawall.

C. Paint MgI-OP-3L - Galvanized Metals, Latex, 3 Coat:
1. One coat galvanize primer. Ultra-Grip Premium.
2. Semi-gloss: Two coats of latex enamel; Spartawall.

D. Paint GI-OP-3L - Gypsum Board/Plaster, Latex, 3 Coat:
1. One coat of latex primer sealer, Vinylastic Select.
2. Semi-gloss: Two coats of latex enamel; Spartawall.
3. Eggshell: Two coats of latex enamel; Spartawall.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
1. Gypsum Wallboard: 12 percent.
2. Plaster and Stucco: 12 percent.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

F. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.

G. Plaster Surfaces to be Painted: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.

H. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

I. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

J. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

K. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's instructions.

C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.

D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

E. Apply each coat to uniform appearance.

F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

G. Sand wood surfaces lightly between coats to achieve required finish.

H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

A. Protect finished coatings until completion of project.

B. Touch-up damaged coatings after Substantial Completion.

END OF SECTION

SECTION 10 1400
SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Room and door signs.

1.02 REFERENCE STANDARDS

A. Title 24, Part 2. C.C.R., 2022 California Building Code, Chapter 11B.

1.03 SUBMITTALS

A. See Section 01 3010 - Submittals, for submittal procedures.

B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.

C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
   1. When room numbers to appear on signs differ from those on the drawings, include the drawing room number on schedule.
   2. Submit for approval by Owner through Architect prior to fabrication.

D. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.

E. Manufacturer's Qualification Statement.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by floor or building.

C. Store tape adhesive at normal room temperature.

PART 2 PRODUCTS

2.01 SIGNAGE APPLICATIONS

A. Room and Door Signs: Provide a sign for every doorway included within the contract work, whether it has a door or not, not including corridors, lobbies, and similar open areas.

2.02 SIGN TYPES

A. Acrylic Room and Accessibility Signs:
   1. Cast acrylic sheet: Manufacturer's standard 1/8 inch thickness and as follows:
      a. Color as selected by architect from manufacturer's full range.
      b. Acrylic matte clear sheets with overall thickness of 1/8 inch.
   2. Unframed panel signs: Fabricate signs with edges mechanically and smoothly finished to comply with the following requirements:
      a. Edge: Square cut (or eased).
      b. Corner: Radiused to 1".
   3. Graphic content and style: Provide sign copy that complies with requirements indicated below and in the sign schedule and drawings for size, spacing, content, mounting height and location, material, finishes and colors of signage.
      a. Pictograms and other artwork to be reversed-applied vinyl or silk-screened process in colors as indicated (or raised image via machine-routed raised copy).
   4. Colored coatings for acrylic sheets:
      a. For background colors, provide Pantone Matching System colored coatings, including inks and paints, that are recommended by acrylic manufacturer for optimum

adherence to surface and that are non-fading for application intended.

b. For raised copy colors (machine routed copy) provide manufacturer's full range of solid through color applique colors.

5. Raised characters shall comply with CBC Section 11B-703.2.
   a. Depth: It shall be 1/32 inch (0.8 mm) minimum above their background and shall be sans serif uppercase and be duplicated in Braille.
   b. Height: It shall be 5/8 inch (15.9 mm) minimum and 2 inches (51 mm) maximum based on the height of the uppercase letter "I". CBC Section 11B-703.2.5.
   c. Finish and Contrast: Characters and their background shall have a non-glare finish. Character shall contrast with their background with either light character on a dark background or dark characters on a light background. CBC Section 11B-703.5.1.
   d. Proportions: It shall be selected from fonts where the width of the uppercase letter "O" is 60% minimum and 110% maximum of the height of the uppercase letter "I". Stroke thickness of the uppercase letter "I" shall be 15% maximum of the height of the character. CBC Sections 11B-703.2.4 and 11B-703.2.6.
   e. Character Spacing: Spacing between individual raised characters shall comply with CBC Section 11B-703.2.7 and 11B-703.2.8.
   f. Format: Text shall be in a horizontal format. CBC Section 11B-703.2.9.
   g. Braille: It shall be contracted (Grade 2) and shall comply with CBC Sections 11B-703.3 and 11B-703.4. Braille dots shall have a domed or rounded shape and shall comply with CBC Table and Figure 11B-703.3.1.
   h. Mounting Height: Tactile characters on signs shall be located 48" minimum to the baseline of the lowest Braille cells and 60" maximum to the baseline of the highest line of raised characters above the finish floor or ground surface. CBC Section and Figure 11B-703.4.1.
   i. Mounting Location: A tactile sign shall be located per CBC Section and Figure 11B-703.4.2 as follows:
      1) alongside a single door at the latch side
      2) on the inactive leaf at double doors with one active leaf.
      3) to the right of the right hand door at double doors with two active leafs.
      4) on the nearest adjacent wall where there is no wall space at the latch side of a single door or at the right side of double doors with two active leafs.
      5) so that a clear floor space of 18"x18" minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position.
   j. Visual Characters shall comply with CBC Section 11B-703.5 and shall be 40" minimum above finish floor or ground.
   k. Pictograms shall comply with CBC Section 11B-703.6.
   l. Symbols of Accessibility shall comply with CBC Section 11B-703.7.
   m. Variable Message Signs shall comply with CBC Section 11B-703.8.

B. Color and Font: Unless otherwise indicated:
   1. Character Font: Helvetica, Arial, or other sans serif font.
   2. Character Case: Upper case only.
   3. Background Color: As selected by Architect.
   4. Character Color: As selected by Architect in contrasting color.

2.03 ACCESSORIES

A. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Attach wall and door mounted panel signs to surfaces using the methods indicated below:
   1. Vinyl tape mounting: Use double sided foam tape, of the thickness indicated, to mount signs to smooth, non-porous surfaces. Do not use this method for vinyl covered or rough surfaces.
   2. Silicone adhesive mounting: Use liquid silicone adhesive recommended by the sign manufacturer to attach signs to irregular, porous or vinyl covered surfaces. Use double sided vinyl tape where recommended by the sign manufacturer to hold the sign in place until the adhesive has fully cured.

C. Install neatly, with horizontal edges level.

D. Mounting height as indicated on the drawings.

E. Locate signs in accordance with approved shop drawings and ADAAG requirements. Install so that sign location is clear of door swing when reading sign.

F. Protect from damage until Substantial Completion; repair or replace damage items.

END OF SECTION

SECTION 10 4400
FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire extinguishers.

B. Fire extinguisher cabinets.

1.02 REFERENCE STANDARDS

A. NFPA 10 - Standard for Portable Fire Extinguishers; 2016; Title 19 C.C.R.

1.03 SUBMITTALS

A. See Section 01 3010 - Submittals, for submittal procedures.

B. Product Data: Provide extinguisher operational features and color and finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fire Extinguisher Cabinets and Accessories:
   1. JL Industries, Inc: www.jlindustries.com.
   2. Larsen's Manufacturing Co: www.larsensmfg.com.
   3. Potter-Roemer: www.potterroemer.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FIRE EXTINGUISHERS

A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 , Ttile 19, and applicable codes, whichever is more stringent.

B. Manufacturer: Larsens, Potter-Roemer, or equal.

C. Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gage.
   1. Class: A:B:C.
   2. Size and classification as scheduled (minimum 2A:10B:C rating).
   3. Finish: Baked polyester powder coat color as selected.

2.03 FIRE EXTINGUISHER CABINETS

A. Metal: Formed stainless steel sheet; 0.036 inch thick base metal.

B. Cabinet Configuration: Semi-recessed type.

C. Door: 0.036 inch thick, reinforced for flatness and rigidity; latch. Hinge doors for 180 degree opening with two butt hinge. Provide nylon catch.

D. Door Glazing: Vertical Duo Panel, Plastic, clear, 1/8 inch thick acrylic. Set in resilient channel gasket glazing.

E. Cabinet Mounting Hardware: Appropriate to cabinet. Pre-drill for anchors.

F. Weld, fill, and grind components smooth.

G. Finish of Cabinet Exterior Trim and Door: No. 4.

H. Finish of Cabinet Interior: White enamel.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install cabinets plumb and level in wall openings, 48 inches from finished floor to center of handle.

C. Secure rigidly in place.

D. Place extinguishers in cabinets.

END OF SECTION

OFFICE IMPROVEMENTS
Descanso Elementary School

SECTION 260100

ELECTRICAL GENERAL PROVISIONS

PART 1 SUMMARY

1.1 This Division of the specification outlines the provisions of the contract work to be performed under this Division.

1.2 This Section applies to and forms a part of each section of specifications in Division 26 and all work performed under the electrical and communications contracts.

1.3 In addition, work in this Division is governed by the provisions of the bidding requirements, contract forms, general conditions and all sections under general requirements.

1.4 These specifications contain statements which may be more definitive or more restrictive than those contained in the General Conditions. Where these statements occur, they shall take precedence over the General Conditions.

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

1.6 Where items are specified in the singular, this Division shall provide the quantity as shown on drawings plus any spares or extras mentioned on drawings or specifications. All specified and supplied equipment shall be new.

PART 2 CONTRACTOR QUALIFICATIONS

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

PART 3 CODES, PERMITS AND FEES

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

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

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

PART 4 EXAMINATION OF PREMISES

4.1 Examine the construction drawings and premises prior to bidding. No allowances will be made for not being knowledgeable of existing conditions.

PART 5 STANDARDS

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

5.1.1 2016 California Electrical Code (CEC), Part 3 Title 24 CCR.
5.1.2 National Fire Protection Association.
5.1.3 Underwriters' Laboratories, Inc. (UL).
5.1.4 Certified Ballast Manufacturers' Association (CBM).
5.1.5 National Electrical Manufacturers' Association (NEMA).
5.1.6 Institution of Electrical & Electronics Engineers (IEEE).
5.1.7 American Society for Testing & Materials (ASTM).
5.1.8 National Board of Fire Underwriters (NBFU).
5.1.9 National Board of Standards (NBS).
5.1.10 American National Standards Institute (ANSI).
5.1.11 Insulated Power Cable Engineers Association (IPECS).
5.1.12 Electrical Testing Laboratories (ETL).
5.1.13 National Electrical Safety Code (NESC).
5.1.14 2016 California Building Code (CBC), Part 2, Title 24 CCR.
5.1.15 2016 California Fire Code (CFC), Part 9, Title 24, CCR.
5.1.16 2016 NFPA 72 with California State Amendments
5.1.17 National Electrical Testing Association (NETA), 2010 or most current

PART 6 DEFINITIONS

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

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

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

PART 7 WORK AND MATERIALS

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

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

PART 8 SHOP DRAWINGS AND SUBMITTALS

8.1 Submit shop drawings and all data in accordance with Division 1 of these specifications and as noted below for all equipment provided under this Division.

8.2 Shop drawings submittals demonstrate to the Architect that the Contractor understands the design concept. The Contractor demonstrates his understanding by indicating which

equipment and material he intends to furnish and install and by detailing the fabrication and installation methods of material and equipment he intends to use. If deviations, discrepancies, or conflicts between submittals and specifications are discovered either prior to or after submittals are processed, notify the Architect immediately.

8.3 Manufacturer's data and dimension sheets shall be submitted giving all pertinent physical and engineering data including weights, cross sections and maintenance instructions. Standard items of equipment such as receptacles, switches, plates, etc., which are cataloged items, shall be listed by manufacturer.

8.4 Index all submittals and reference them to these specifications. All submittal items shall be assembled and submitted, one for each specification section. (Multiple specification sections may be grouped together in one common submittal binder, as long as each individual section is clearly identified.) Partial or incomplete submittal sections will not be reviewed.

PART 9 EQUIPMENT PURCHASES

9.1 Arrange for purchase and delivery of all materials and equipment within 20 days after approval of submittals. All materials and equipment must be ordered in ample quantities for delivery at the proper time. If items are not on the project in time to expedite completion, the Owner may purchase said equipment and materials and deduct the cost from the contract sum.

9.2 Provide all materials of similar class or service by one manufacturer.

PART 10 COOPERATIVE WORK

10.1 Correct without charge any work requiring alteration due to lack of proper supervision or failure to make proper provision in time. Correct without charge any damage to adjacent work caused by the alteration.

10.2 Cooperative work includes: General supervision and responsibility for proper location and size of work related to this Division, but provided under the other sections of these specifications, and installation of sleeves, inserts, and anchor bolts for work under each section in this Division.

PART 11 VERIFICATION OF DIMENSIONS

11.1 Scaled and figured dimensions are approximate only. Before proceeding with work, carefully check and verify dimensions, etc., and be responsible for properly fitting equipment and materials together and to the structure in spaces provided.

11.2 Drawings are essentially diagrammatic, and many offsets, bends, pull boxes, special fittings, and exact locations are not indicated. Carefully study drawings and premises in order to determine best methods, exact location, routes, building obstructions, etc. and install apparatus and equipment in manner and locations to avoid obstructions, preserve headroom, keep openings and passageways clear, and maintain proper clearances.

PART 12 CUTTING AND PATCHING

12.1 All cutting, and patching shall be in accordance with Division 1 of these specifications and as noted below.

12.2 Cut existing work and patch as necessary to properly install new work. As the work progresses, leave necessary openings, holes, chases, etc., in their correct location. If the

required openings, holes, chases, etc., are not in their correct locations, make the necessary corrections at no cost to the Owner. Avoid excessive cutting and do not cut structural members including wall framing without the consent of the Architect.

PART 13 CLOSING-IN OF UNINSPECTED WORK

13.1 Cover no work until inspected, tested, and approved by the Architect. Where work is covered before inspection and test, uncover it and when inspected, tested, and approved, restore all work to original proper condition at no additional cost to Owner.

PART 14 ACCESSIBILITY

14.1 Install all control devices or other specialties requiring reading, adjustment, inspection, repairs, removal, or replacement conveniently and accessibly throughout the finished building.

14.2 All required access doors or panels in walls and ceilings are to be furnished and installed as part of the work under this Section. Refer to Division 1 of these specifications and as noted below.

14.3 Where located in fire rated assemblies, provide doors which match the rating of the assembly and are approved by the jurisdictional authority.

14.4 Refer to 'finish schedule' for types of walls and ceilings in each area and the architectural drawings for rated wall construction.

14.5 Coordinate work of the various sections to locate specialties requiring accessibility with others to avoid unnecessary duplication of access doors.

PART 15 FLASHING

15.1 Flash and counter flash all conduits penetrating roofing membrane as shown on Architectural drawings. All work shall be in accordance with Division 7 of these specifications.

PART 16 IDENTIFICATION OF EQUIPMENT

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

16.1.1 General:

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

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

16.1.2 Lighting and Local Panelboards:

16.1.2.1 Panel identification shall be with white and black micarta nameplates. Letters shall be no less than 3/8" high.

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

16.1.3 Distribution Switchboards and Feeders Sections:

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

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

16.1.4 Disconnect Switches, Motor Starters and Transformers:

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

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

PART 17 CONSTRUCTION FACILITIES

17.1 Furnish and maintain from the beginning to the completion all lawful and necessary guards, railings, fences, canopies, lights, warning signs, etc. Take all necessary precautions required by City, State Laws, and OSHA to avoid injury or damage to any persons and property.

17.2 Temporary power and lighting for construction purposes shall be provided under this Section. All work shall be in accordance with Division 1 of these specifications.

PART 18 GUARANTEE

18.1 Guarantee all material, equipment and workmanship for all sections under this Division in writing to be free from defect of material and workmanship for one year from date of final acceptance, as outlined in the general conditions. Replace without charge any material or equipment proven defective during this period. The guarantee shall include performance of equipment under all site conditions, conditions of load, installing any additional items of control and/or protective devices, as required.

PART 19 PATENTS

19.1 Refer to the General Conditions for Contractor's responsibilities regarding patents.

PART 20 EQUIPMENT ROUGH-IN

20.1 Rough-in all equipment, fixtures, etc. as designed on the drawings and as specified herein. The drawings indicate only the approximate location of rough-ins. Mounting heights of all switches, receptacles, wall mounted fixtures and such equipment must be coordinated with the Architectural Designs. The Contractor shall obtain all rough-in information before progressing with any work for rough-in connections. Minor changes in

the contract drawings shall be anticipated and provided for under this Division of the specifications to comply with rough-in requirements.

PART 21 OWNER FURNISHED AND OTHER EQUIPMENT

21.1 Rough-in and make final connections to all Owner furnished equipment shown on the drawings and specified, and all equipment furnished under other sections of the specifications.

PART 22 EQUIPMENT FINAL CONNECTIONS

22.1 Provide all final connections for the following:

22.1.1 All equipment furnished under this Division.

22.1.2 Electrical equipment furnished under other sections of the specification.

22.1.3 Owner furnished equipment as specified under this Division.

PART 23 INSERTS, ANCHORS, AND MOUNTING SLEEVES

23.1 Inserts and anchors must be:

23.1.1 Furnished and installed for support of work under this Division.

23.1.2 Mounting of equipment that is of such size as to be free standing and that equipment which cannot conveniently be located on walls, such as motor starters, etc., shall be rigidly supported on a framework of galvanized steel angle of Unistrut or B-line systems with all unfinished edges painted.

23.1.3 Furnish and install all sleeves as required for the installation of all work under all Sections of this Division and for all communication systems including any communication systems described in this Section which are bid to the General Contractor. Sleeves through floors, roof, and walls shall be as described in “Conduit and Fittings” Section 26 05 33.

PART 24 SEISMIC ANCHORING

24.1 All switchgear and other free standing electrical equipment or enclosures shall be anchored to the floor and braced at the top of the equipment to the structure. Where details have not been provided on the drawings, anchorage shall comply with CBC Section 1616A.1.17 and the MEP Anchorage & Bracing notes on the drawings. The Contractor shall submit drawings signed by the Contractors registered structural Engineer indicating method of compliance prior installation.

24.2 All sound systems, communication, signal or data networking equipment or enclosures shall be anchored to the structure. Where details have not been provided on the drawings, anchorage shall comply with CBC Section 1616A.1.17. The Contractor shall submit drawings signed by the Contractors registered Structural Engineer indicating method of compliance prior to installation.

PART 25 RUST PROOFING

25.1 Rust proofing must be applied to all ferrous metals and shall be in accordance with Section 05500 of these specifications and as noted below.

25.1.1 Hot-dipped galvanized shall be applied and after forming of angle-iron, bolts, anchors, etc.

25.1.2 Hot-dipped galvanized coating shall be applied after fabrication for junction boxes and pull boxes cast in concrete.

PART 26 GENERAL WIRING

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

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

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

PART 27 SEPARATE CONDUIT SYSTEMS

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

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

PART 28 CLEANUP

28.1 In addition to cleanup specified under other sections, thoroughly clean all parts of the equipment. Where exposed parts are to be painted, thoroughly clean off any spattered construction materials and remove all oil and grease spots. Wipe the surface carefully and scrape out all cracks and corners.

28.2 Use steel brushes on exposed metal work to carefully remove rust, etc., and leave smooth and clean.

28.3 During the progress of the work, keep the premises clean and free of debris.

PART 29 PAINTING

29.1 Paint all unfinished metal as required in accordance with Division 1 of these specifications. (Galvanized and factory painted equipment shall be considered as having a sub-base finish.)

PART 30 GENERAL DEMOLITION REQUIREMENTS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

PART 31 PROJECT CLOSEOUT

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

31.2 Equipment Lists and Maintenance Manuals:

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

31.2.1.1 Name, model, and manufacturer.

31.2.1.2 Complete parts drawings and lists.

31.2.1.3 Local supply for parts and replacement and telephone number.

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

31.3 Maintenance manuals shall be furnished for each applicable section of the specifications and shall be suitably bound with hard covers and shall include all available manufacturers' operating and maintenance instructions, together with "as-built" drawings to properly operate and maintain the equipment. The equipment lists and maintenance manuals shall be submitted in duplicate to the Architect for approval not less than 10 days prior to the completion of the job. The maintenance manuals shall also include the name, address, and phone numbers of all subcontractors involved in any of the work specified herein. Four copies of the maintenance manuals bound in single volumes shall be provided.

PART 32 RECORD DRAWINGS

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

32.2 Drawings shall show locations of all concealed underground conduit runs, giving the number and size of conduit and wires. Underground ducts shall be shown with cross section elevations and shall be dimensioned in relation to permanent structures to indicate their exact location. Drawing changes shall not be identified only with

referencing CORs and RFIs, the drawings shall reflect all of the actual additions or changes made. All as-built drawing information shall be prepared by the contractor in AutoCAD, updating the contract computer files as needed to reflect actual installed conditions for all site plans, lighting, power, communication, networking, audio visual, security or fire alarms systems included in the scope of work for this project.

32.3 One set of these record drawings shall be delivered to the Architect. The engineer will review documents for completeness, and will not be responsible for editing contractor computer files.

PART 33 CHANGES AND EXTRA WORK

33.1 When **changes** in work are requested, the Division 26 Contractor shall provide unit prices for the work involved in accordance with Division 1 of these specifications, and the following:

33.1.1 The material Costs shall **not exceed** the invoice pricing from an Electrical Distributor indicating the pricing provided at the time of bid. The Contractor shall submit a print out copy of the pricing with the change order to substantiate these values. s

33.1.2 The labor Costs shall **not exceed** the latest edition of the “NECA Manual of Labor Units” **normal column**.

33.2 When **credits** in work are requested, the Division 26 Contractor shall provide unit prices for the work involved in accordance with Division 1 of these specifications, and the following:

33.2.1 The Material Costs shall **not be less than 80% of** the invoice pricing from an Electrical Distributor indicating the pricing provided at the time of bid. Restocking fees may also be included in this amount where applicable.

33.2.2 The Labor Costs shall **not be less than 80% of** the latest edition of the “NECA Manual of Labor Units” **normal column**.

33.3 Conduit pricing for conduits of all types sized 3" or smaller.

When changes in the scope of work require the Contractor to estimate conduit Installations, they shall **NOT include labor values (only material cost may be included)** for any of the below items. The labor values for conduit installation represented in the NECA manual are inflated to a point where additional labor for the below items can not be justified.

33.3.1 Couplings.

33.3.2 Set Screw or Compression Fittings, locknuts, Bushings and washers.

33.3.3 Conduit straps and associated screws or nails.

33.3.4 LB fittings or other specialty fittings or specialty mounting hardware may be included where needed.

33.4 Wire pricing for all types and sizes.

When changes in the scope of work require the Contractor to estimate wire installations they shall **NOT include labor values (only material cost may be included)** for any of

the below items. The labor values for wire installation represented in the NECA manual are inflated to a point where additional labor for the below items can not be justified.

33.4.1 Locknuts, Bushings, tape, wire markers.

33.5 When changes in the scope of work require other equipment installations such as lighting fixtures, panelboards, switchboards, wiring devices, communications equipment etc. the Contractor shall **NOT include labor values (only material cost may be included)** for any of the below items. The labor values for these equipment items represented in the NECA manual are inflated to a point where additional labor for the below items can not be justified.

33.5.1 Associated screws, nails, bolts, anchors or supports.

33.5.2 Locknuts, washers, tape.

33.6 The total labor hours for extra work will be required to be calculated as follows:

33.6.1 Change orders with 1 to 30 total labor hours

General Laborer	10%	of total labor hours
Journeyman	10%	of total labor hours
Foreman	80%	of total labor hours

33.6.2 Change orders with 31 to 100 total labor hours

General Laborer	20%	of total labor hours
Journeyman	40%	of total labor hours
Foreman	40%	of total labor hours

33.6.3 Change orders with over 100 total labor hours

General Laborer	30%	of total labor hours
Journeyman	50%	of total labor hours
Foreman	20%	of total labor hours

33.7 When change orders are issued which allow the work to be completed in the normal sequence of construction, the labor rates shall be based on the most current “Prevailing Wage” – straight time total hourly rate. When change orders require the Contractor to work out of sequence the “Prevailing Wage“ – daily overtime hourly rate shall apply. Special condition situations shall be reviewed on an individual basis for alternate hourly rate schedules.

33.8 Costs **will not** be permitted for additional supervision on site or office time for processing any change order other than the 10% overhead allowance as described in Division 1. Cost for special equipment required to install items for an individual change order are permitted and must be individually identified. Lump Sum cost for small tools or any other cost not specifically required for the change order are not permitted.

33.9 Contractor estimates shall be formatted to clearly identify each of the following:

33.9.1 Line item description of each type of material or labor item.

33.9.2 Description of quantity for each item.

33.9.3 Description of (material cost per / quantity).

33.9.4 Description of (labor cost per / quantity).

33.9.5 Description of total labor hour breakdown per Foreman, Journeyman or General Laborer as described above.

PART 34 ELECTRONIC FILES

34.1 The Contractor shall make a ***written*** request directly to Johnson Consulting Engineers for electronic drawing files. As a part of the written request, please include the following information:

34.1.1 Clearly indicate each drawing sheet needed (i.e., E1.1, E2.1, etc.).

34.1.2 Identify the name, phone number, mailing address and e-mail address of the person to receive the files.

34.1.3 Provide written confirmation and agreement with the requirements described for payment of computer files, as described below.

34.2 Detail or riser diagram sheets, or any other drawings other than floor plans or site plans, ***will not be made available to the Contractor***.

34.3 Files will only be provided in the AutoCAD format in which they were created.

34.4 Requests for files will be processed as soon as possible; a minimum of 7 working days should be the normal processing time. The Contractor shall be completely responsible for requesting the files in time for their use.

END OF SECTION

OFFICE IMPROVEMENTS
Descanso Elementary School

SECTION 260519

POWER CONDUCTORS

PART 1 GENERAL

1.1 Furnish and install wire and cable for branch circuits and feeders specified herein and as shown on the electrical drawings.

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

1.2.1 All cables and terminations

1.3 <u>Common submittal mistakes which will result in the submittals being rejected:</u>

1.3.1 Not including all items listed in the above itemized description.

1.3.2 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining, or clouding the items to be reviewed, or crossing out the items which are not applicable.

1.3.3 Not including actual manufacturer's catalog information of proposed products.

1.3.4 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed

PART 2 PRODUCTS

2.1 Wire and cable Rated 120 volt to 600 volt.

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

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

2.1.3 MC type armored cable reference Section 26 05 33.

2.2 Wire and cable for systems below120 volts.

2.2.1 All low voltage and communications systems cables routed underground shall be provided with a moisture resistant outer jacket, West Penn “Aquaseal” or equal, unless otherwise specified.

PART 3 EXECUTION

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

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

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

3.2.2 No. 10 wire and smaller: Circuit wiring connections to lighting fixtures and other hard wired equipment shall be made with pressure type solderless connectors, Buchanan, Scotchlock, Wing Nut, or approved equal. Alternate “WAGO” #773 series or “IDEAL” #32, 33, 34 and 39 series push wire style connectors are also acceptable.

3.3 All wiring shall be continuous without splicing unless where specifically noted on the drawings or where permitted below.

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

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

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

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

3.4 All wiring throughout shall be color coded as follows:

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

Ground	Green	Green

3.5 Wiring must be color coded throughout its entire length, except feeders may have color coded plastic tape at both ends and any other accessible point.

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

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

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

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

3.10 All conductors shall be installed in such a manner as to not exceed the manufacturers' recommended pulling tension and bending radius. The equipment used for pulling must be specifically designed for the purpose. Motorized vehicles such as pickup trucks, are not acceptable.

END OF SECTION

OFFICE IMPROVEMENTS
Descanso Elementary School

SECTION 260526

GROUNDING

PART 1 GENERAL

1.1 Furnish and install grounding and grounding conductors and electrodes as specified herein and as shown on the drawings.

1.2 Submit catalog data for all components.

1.3 **Common submittal mistakes which will result in the submittals being rejected:**

1.3.1 Not including all items listed in the above itemized description.

1.3.2 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.

1.3.3 Not including actual manufacturer's catalog information of proposed products.

1.3.4 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 EXECUTION

2.1 Grounding

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

2.1.2 Provide an insulated equipment grounding conductor in all branch circuit and feeder raceway systems, sized in accordance with CEC 250-1122.

2.1.3 Provide an additional individual insulated grounding conductor for each circuit which contains an isolated ground receptacle or surge suppression receptacle.

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

2.1.5 Except for connections which access for periodic testing is required, make grounding connections which are buried or otherwise inaccessible by exothermite type process.

2.1.6 The following ohmic values shall be test certified for each item listed. A written report signed and witnessed by the project IOR shall be provided to the engineer.

If the ohmic value listed cannot be obtained additional grounding shall be installed to reach the value listed.

2.1.6.1 Service. . . . . .10 ohms.

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

2.1.6.3 Manholes, handholes, etc.
. . . . . 10 ohms.

END OF SECTION

OFFICE IMPROVEMENTS
Descanso Elementary School

SECTION 260533

CONDUIT AND FITTINGS

PART 1 GENERAL

1.1 Furnish and install conduit and fittings as shown on the drawings and as specified herein.

1.2 Submit Manufacturer's data on the following:

1.2.1 Conduit.

1.2.2 Fittings

1.2.3 Fire stopping Material.

1.2.4 Surface Raceways.

1.2.5 Type MC or MC-PCS cable, provide construction details and UL "E" number.

1.3 **Common submittal mistakes which will result in the submittals being rejected:**

1.3.1 Not including all items listed in the above itemized description.

1.3.2 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.

1.3.3 Not including actual manufacturer's catalog information of proposed products.

1.3.4 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 PRODUCTS

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

2.2 PVC conduit shall be Carlon or approved equal.

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

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

2.4.1 Comply with UL 1479 and CEC 330

2.4.2 90ºC, copper, THHN conductors.

2.4.3 Minimum #12 insulated grounding conductor.

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

2.4.5 Oversized (150%) neutrals or separate neutrals shall be provided.

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

2.4.7 Interlocked armored **aluminum** sheath.

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

2.4.9 Color code cable according to cable type and configuration.

2.4.10 Acceptable manufacturers are AFC and Alflex.

2.5 MC-PCS luminary armored cable , when utilized, shall be provided with the following:

2.5.1 Comply with UL 1479 and CEC 330

2.5.2 90ºC, copper, THHN conductors.

2.5.3 Minimum #12 insulated grounding conductor.

2.5.4 Lighting phase conductors sized No. 10 and smaller shall be solid, lighting control conductors shall be sized no. 16 solid.

2.5.5 Interlocked armored **aluminum** sheath.

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

2.5.7 Color code phase cable according to cable type and configuration. color code control conductors purple/gray.

2.5.8 Acceptable manufacturers are AFC and Alflex.

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

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

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

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

2.10 Where branch circuit or communication raceways cannot be concealed in ceilings or walls and are required to be exposed in interior spaces, provide nonmetallic surface raceway system sized per the manufacturer capacity requirements. A full complement of nonmetallic fittings must be available and matching device boxes and cover plates must be provided. The color of the raceway system, components and boxes shall be (white). Where data networking cabling is to be installed, all raceway fittings shall meet Category 5 radius requirements. Where specific raceway types have been noted on the drawings they shall be as follows:

2.10.1	System 'SR'	Hubbell	WALLTRAK 1 series
		Wiremold	ECLIPSE PN05series
		Panduit	LD5 series
		Hellerman-Tyton	TSR2 series
2.10.2	System 'SR2'	Hubbell	WALTRAK 22
		Wiremold	2300D Series
		Panduit	D2P10
		Hellerman-Tyton	TSR3 series
2.10.3	System 'SR3'	Hubbell	BASETRAK series
		Wiremold	5400 - series
		Panduit	70 series
		Hellerman-Tyton	MCR Infostream" series

Provide with offset boxes, inline boxes may only be used where specifically shown on the drawings.

PART 3 FITTINGS

3.1 All metallic fittings, including those for EMT, flexible conduit, or malleable iron. Die cast fittings of any other material are not permitted.

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

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

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

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

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

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

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

3.9 MC or MC-PCS type armored cable shall be provided with listed clamp type die cast zinc set screw connectors. Anti-short bushings shall be provided at all cable ends.

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

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

PART 4 EXECUTION

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

4.2 Conduit sizes for various numbers and sizes of wire shall be as required by the CEC, but not smaller than ½" for power wiring and ¾" for communications and fire alarm systems unless otherwise noted. Conduit in slab or below grade shall be ¾" minimum trade size, unless otherwise identified.

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

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

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

4.5.1 Exposed exterior locations.

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

4.5.3 In hazardous or classified areas as required by CEC.

4.6 EMT conduit shall be used for areas as follows:

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

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

4.7 Flexible conduit shall be used for areas as follows:

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

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

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

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

4.8 MC armored cable may be used as follows:

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

4.9 MC-PCS luminary armored cable may be used as follows:

4.9.1 All Lighting branch circuit wiring for lighting circuits where permitted and installed in compliance with UL 1569 and CEC 300-22(c), 330. This cable permits conductors of control circuits to be placed in a cable with lighting power circuits or class 1 circuits.

4.9.2 It shall not be considered an acceptable option to install lighting control class 1 circuits as an open wire installation.

4.10 MC and MC-PCS armored cable shall **not** be used for the following areas:

4.10.1 Any exterior, underground or buried in concrete circuits.

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

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

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

4.10.5 Any hazardous rated area.

4.11 Plastic conduit shall be used for all exterior underground, in slab, and below slab on grade conduit installations. Install bell ends at all conduit terminations in manholes and pull boxes. Where plastic conduit transitions from below grade to above grade, no plastic conduit shall extend above finished exterior grade, or above interior finished floor level.

4.12 Plastic conduit joints shall be made up in accordance with the manufacturer's recommendations for the particular conduit and coupling selected. Conduit joint couplings shall be made watertight. Plastic conduit joints shall be made up by brushing a plastic solvent cement on the inside of a plastic fitting and on the outside of the conduit ends. The conduit and fitting shall then be slipped together with a quick one-quarter turn twist to set the joint tightly.

4.13 All underground conduit depths shall be as detailed on the drawings or a minimum of 30" below finished grade (when not specifically detailed otherwise), for all exterior underground conduits. Where concrete slurry or concrete encasement is provided, include “Red” color dye in mixture.

4.14 All underground conduits for power systems (600v and higher), shall be concrete encased and a minimum of 48” below grade or as detailed on the drawings. Where concrete slurry or concrete encasement is provided, include “Red” color dye in mixture.

4.15 Conduit shall be continuous from outlet to outlet, cabinet or junction box, and shall be so arranged that wire may be pulled in with the minimum practical number of junction boxes.

4.16 All conduits shall be concealed wherever possible. All conduit runs may be exposed in mechanical equipment rooms, electrical equipment rooms, electrical closets, and in existing or unfinished spaces. No conduit shall be run exposed in finished areas without the specific approval of the Architect.

4.17 All raceways which are not buried or embedded in concrete shall be supported by straps, clamps, or hangers to provide a rigid installation. Exposed conduit shall be run in straight lines at right angles to or parallel with walls, beams, or columns. In no case shall conduit be supported or fastened to other pipes or installed to prevent the ready removal of other trades piping. Wire shall not be used to support conduit.

4.18 It shall be the responsibility of the Contractor to consult the other trades before installing conduit and boxes. Any conflict between the location of conduit and boxes, piping, duct work, or structural steel supports, shall be adjusted before installation. In general, large pipe mains, waste, drain, and steam lines shall be given priority.

4.19 Conduits above lay-in grid type ceilings shall be installed in such a manner that they do not interfere with the "lift-out" feature of the ceiling system. Conduit runs shall be installed to maintain the following minimum spacing wherever practical.

4.19.1 Water and waste piping not less than 3".

4.19.2 Steam and steam condensate lines not less than 12".

4.19.3 Radiation and reheat lines not less than 6".

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

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

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

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

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

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

4.24 Supports: Conduit shall be supported at intervals as required by the California Electrical Code. Where conduits are run individually, they shall be supported by approved conduit straps or beam clamps. Straps shall be secured by means of toggle bolts on hollow masonry, machine screws or bolts on metal surfaces, and wood screws on wood construction. **[No perforated straps or wire hangers of any kind will be permitted. Where individual conduits are routed, or above ceilings, they shall be supported by**

hanger rods and hangers.] Conduits installed exposed in damp locations shall be provided with clamp backs under each conduit clamp, to prevent accumulation of moisture around the conduits.

4.25 Where a number of conduits are to be run exposed and parallel, one with another, they shall be grouped and supported by trapeze hangers. Hanger rods shall be fastened to structural steel members with suitable beam clamps or to concrete inserts set flush with surface. A reinforced rod shall be installed through the opening provided in the concrete inserts. Beam clamps shall be suitable for structural members and conditions. Rods shall be galvanized steel 3/8" diameter minimum. Each conduit shall be clamped to the trapeze hanger with conduit clamps.

4.26 All concrete inserts and pipe clamps shall be galvanized. All steel bolts, nuts, washers, and screws shall be galvanized or cadmium plated. Individual hangers, trapeze hangers and rods shall be prime-coated.

4.27 Openings through fire rated floors/walls and/or smoke walls through which conduits pass shall be sealed by Fire stopping material to comply with Division 1 to seal off flame, heat, smoke and fire gases. Sleeves shall be provided for power or communication system cables which are not installed in conduits, and shall be sealed inside and out to comply with manufacturers UL system design details. Where multiple conduits and/or cable tray systems pass thru fire-rated walls at one location, the Contractor shall submit copies of the manufacturers UL system design details proposed for use on this project. All Fire stopping material shall have an hourly fire-rating equal to or higher than the fire rating of the floor or wall through which the conduit, cables, or cable trays pass.

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

4.29 All conduits which are part of a paralleled feeder or branch circuit shall be installed underground.

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

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

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

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

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

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

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

4.31.3 No length of conduit above grade shall be installed to exceed 150 feet between pull boxes, or points of connection, unless where specifically detailed on the drawings.

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

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

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

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

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

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

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

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

END OF SECTION

OFFICE IMPROVEMENTS
Descanso Elementary School

SECTION 260534

OUTLET AND JUNCTION BOXES

PART 1 GENERAL

1.1 Furnish and install electrical wiring boxes as specified and as shown on the electrical drawings.

1.2 Submit manufacturer's data for all items.

1.3 <u>Common submittal mistakes which will result in the submittals being rejected:</u>

1.3.1 Not including all items listed in the above itemized description.

1.3.2 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.

1.3.3 Not including actual manufacturer's catalog information of proposed products.

1.3.4 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 PRODUCTS

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

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

2.3 Boxes generally shall be hot dipped galvanized steel with knockouts. Boxes on exterior surfaces or in damp locations shall be corrosion resistant, cast feraloy and shall have threaded hubs for rigid conduit and neoprene gaskets for their covers. Boxes shall be Appleton Type FS, Crouse-Hinds, or the approved equal. Conduit bodies shall be corrosion resistant, cast malleable iron. Conduit bodies shall have threaded hubs for rigid conduit and neoprene gaskets for their covers. Conduit bodies shall be Appleton Unilets, Crouse-Hinds, or the approved equal. Where recessed, boxes shall have square cut corners.

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

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

2.6 Pull and junction boxes shall be code gauge boxes with screw covers. Boxes shall be rigid under torsional and deflecting forces and shall be provided with angle from framing where required. Boxes shall be 4" square with a blank cover in unfinished areas and with

a plaster ring and blank cover in finished areas. Covers for flush mounted oversize boxes shall extend ¾" past boxes all around. Covers for 4" square boxes shall extend ¼" past box all around.

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

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

2.7.2 The Contractor shall provide all plywood backboards indicated on walls or inside equipment enclosures. All backboards shall be a minimum of ¾" thick fire rated type plywood.

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

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

2.8.1 All boxes shall be a minimum of 4-11/16" square x 2-1/8" deep.

2.8.2 Where pull boxes are required on individual conduits 1-¼" or smaller, provide 4-11/16" square x 2-1/8" deep boxes. Where pull boxes are required on conduits larger than 1-¼" for straight pull through, provide eight times the conduit trade size for box length. Where pull boxes are required on conduits larger than 1-¼" for an angle or a U-pull through installation, provide a minimum distance of six times the conduit trade size between the entering and exiting conduit run for each cable.

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

PART 3 EXECUTION

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

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

3.3 Furnish and install all plaster rings as may be required. Plaster rings shall be installed on all boxes where the boxes are recessed. Plaster rings shall be of a depth to reach the

finished surface. Where required, extension rings shall be installed so that the plaster ring is flush with the finished surface.

3.4 All cabinets and boxes shall be secured by means of toggle bolts on hollow masonry; expansion shields and machine screws or standard precast inserts on concrete or solid masonry; machine screws or bolts on metal surfaces and wood screws on wood construction. All wall and ceiling mounted outlet boxes shall be supported by bar supports extending from the studs or channels on either side of the box. Boxes mounted on drywall or plaster shall be secured to wall studs or adequate internal structure.

3.5 Boxes with unused punched-out openings shall have the openings filled with factory-made knockout seals.

3.6 Where standby power and normal power are to be located in the same outlet box or 480V in a switch box, install partition barriers to separate the various systems.

3.7 All device boxes and junction boxes for fire alarm system shall be painted red and shall be 4-11/16” square by 2-1/8” deep. No exceptions.

END OF SECTION

OFFICE IMPROVEMENTS
Descanso Elementary School

SECTION 260923

DIGITAL LIGHTING CONTROL SYSTEM

PART 1 GENERAL

1.1 Furnish and install automatic lighting controls as shown on the drawings and as specified herein Submit manufacturers' data on all items.

1.2 Equipment shall be UL listed, comply with those portions of CEC as applicable to electrical wiring work and comply with those portions of NEMA or UL pertaining to types of electrical equipment and enclosures. The equipment shall also be certified by the California Energy Commission.

1.3 The manufacturer of the lighting control equipment shall have been actively engaged in the manufacture of the types and capacities required for the application for at least three years. It is the sole responsibility of the Division 26 contractor to ensure that submittals of material meets the performance specifications contained herein.

1.4 All components and assemblies shall be factory pre-tested and burned-in as a system for 48 hours prior to shipping.

1.5 Control Intent – Control Intent includes, but is not limited to:

1.5.1 Defaults and initial calibration settings for such items as time delay, sensitivity, fade rates, etc.

1.5.2 Initial sensor and switching zones

1.5.3 Initial time switch settings

1.5.4 Task lighting and receptacle controls

1.5.5 Emergency Lighting control (if applicable)

1.5.6 Manufacturer shall submit a point-to-point line diagram of the system configuration including all devices and accessories required to complete the system.

1.5.7 Manufacturer shall submit data sheets on the components and system submitted, with descriptions of hardware and software components.

SYSTEM DESCRIPTION & OPERATION

1.6 The Lighting Control and Automation system as defined under this section covers the following equipment:

1.6.1 Digital Occupancy Sensors – Self-configuring, digitally addressable and calibrated occupancy sensors with LCD display and two-way active infrared (IR) communications

1.6.2 Digital Switches – Self-configuring, digitally addressable pushbutton on/off, dimming, and scene switches with two-way active infrared (IR) communications

1.6.3 Handheld remotes for personal control – One-button dimming, two-button on/off, or five-button scene remotes provide control using infrared communications. Remote may be configured in the field to control selected loads or scenes without special tools

1.6.4 Digital Daylighting Sensors – Single-zone closed loop, multi-zone open loop and single-zone dual-loop daylighting sensors with two-way active infrared (IR) communications can provide switching, bi-level, tri-level or dimming control for daylight harvesting

1.6.5 Digital Room Controllers – Self-configuring, digitally addressable one, two or three relay plenum-rated controllers for on/off control. Selected models include 0-10 volt or line voltage forward phase control dimming outputs and integral current monitoring capabilities

1.6.6 Digital Plug-Load Controllers – Self-configuring, digitally addressable, single relay, plenum-rated application-specific controllers. Selected models include integral current monitoring capabilities

1.6.7 Configuration Tools – Handheld remote for room configuration and relay panel programming provides two way infrared (IR) communications to digital devices and allows complete configuration and reconfiguration of the device / room from up to 30 feet away. Unit to have Organic LED display, simple pushbutton interface, and allow bi-directional communication of room variables and occupancy sensor settings. Computer software also customizes room settings

1.6.8 Digital Lighting Management (DLM) local network – Free topology, plug-in wiring system (Cat 5e) for power and data to room devices

1.6.9 Digital Lighting Management (DLM) segment network – Linear topology, BACnet MS/TP network (1.5 twisted pair, shielded,) to connect multiple DLM local networks for centralized control

1.6.10 Network Bridge – provides BACnet MS/TP-compliant digital networked communication between rooms, panels and the Segment Manager or building automation system (BAS) and automatically creates BACnet objects representative of connected devices.

1.6.11 Segment Manager – provides web browser-based user interface for system control, scheduling, power monitoring, room device parameter administration and reporting

1.6.12 Programming and Configuration software – Optional PC-native application capable of accessing DLM control parameters within a room, for the local network, via a USB adapter, or globally, for many segment networks simultaneously, via BACnet/IP communication

1.6.13 LMCP Digital Lighting Management Relay Panel – provides up to 8, 24, or 48 mechanically latching relays. Relays include a manual override and a single push-on connector for easy installation or removal from the panel. Panel accepts program changes from handheld configuration tool for date and time, location, holidays, event scheduling, button binding and group programming. Provides BACnet MS/TP-compliant digital networked communication between other lighting controls and/or building automation system (BAS)

1.6.14 Emergency Lighting Control Unit (ELCU) – allows a standard lighting control device to control emergency lighting in conjunction with normal lighting in any area within a building

LIGHTING CONTROL APPLICATIONS

1.7 Unless relevant provisions of the applicable local Energy Codes are more stringent, provide a minimum application of lighting controls as follows:

1.7.1 Space Control Requirements – Provide occupancy/vacancy sensors with Manual- or Partial-ON functionality in all spaces except toilet rooms, storerooms, library stacks, or other applications where hands-free operation is desirable and Automatic-ON occupancy sensors are more appropriate. Provide Manual-ON occupancy/vacancy sensors for any enclosed office, conference room, meeting room, open plan system and training room. For spaces with multiple occupants, or where line-of-sight may be obscured, provide ceiling- or corner-mounted sensors and Manual-ON switches. All classrooms shall have partial-ON functionality.

1.7.2 Bi-Level Lighting – Provide multi-level controls in all spaces except toilet rooms, storerooms, library stacks, or applications where variable dimming is used

1.7.3 Task Lighting / Plug Loads – Provide automatic shut off of non-essential plug loads and task lighting in all spaces except toilet rooms and storerooms. Provide Automatic-ON of plug loads whenever spaces are occupied. For spaces with multiple occupants a single shut off consistent with the overhead lighting may be used for the area

1.7.4 Daylit Areas – Provide daylight-responsive automatic control in all spaces (conditioned or unconditioned) where daylight contribution is available as defined by relevant local building energy code:

1.7.4.1 All luminaires within code-defined daylight zones shall be controlled separately from luminaires outside of daylit zones

1.7.4.2 Daytime set points for total ambient illumination (combined daylight and electric light) levels that initiate dimming shall be programmed in compliance with relevant local building energy codes

1.7.4.3 Multiple-leveled switched daylight harvesting controls may be utilized for areas marked on drawings

1.7.4.4 Provide smooth and continuous daylight dimming for areas marked on drawings. Daylighting control system may be designed to turn off electric lighting when daylight is at or above required lighting levels, only if system functions to turn lamps back on at dimmed level, rather than turning full-on prior to dimming.

1.7.5 Conference, meeting, training, auditoriums, and multipurpose rooms shall have controls that allow for independent control of each local control zone. Rooms larger than 300 square feet shall instead have at least four (4) pre-set lighting scenes unless otherwise specified. Occupancy / vacancy sensors shall be provided to extinguish all lighting in the space. Spaces with up to four moveable walls shall include controls that can be reconfigured when the room is partitioned.

1.8 Submit shop drawings and manufacturers' data for all components including:

1.8.1 Manufacturer shall submit in bill-of-material form an itemized list of all materials supplied to meet the specification.

1.8.2 Manufacturer shall submit dimensional drawings of lighting control panel(s).

1.8.3 Manufacturer shall submit a point-to-point line diagram of the system configuration including all devices and accessories required to complete the system.

1.8.4 Manufacturer shall submit data sheets on the components and system submitted, with descriptions of hardware and software components

1.8.5 Composite wiring and/or schematic diagram of each control circuit as proposed to be installed

1.8.6 Show exact location of all digital devices, including at minimum sensors, room controllers, and switches for each area on reflected ceiling plans. (Contractor must provide AutoCAD format reflected ceiling plans)

1.8.7 Provide room/area details including products and sequence of operation for each room or area. Illustrate typical acceptable room/area connection topologies

1.8.8 Network riser diagram including floor and building level details. Include network cable specification and end-of-line termination details, if required. Illustrate points of connection to integrated systems. Coordinate integration with mechanical and/or other trades

QUALITY ASSURANCE

1.9 Manufacturer: Minimum 10 years' experience in manufacture of lighting controls

PROJECT CONDITIONS

1.10 Do not install equipment until following conditions can be maintained in spaces to receive equipment:

1.10.1 Ambient temperature: 0° to 40° C (32° to 104° F)

1.10.2 Relative humidity: Maximum 90 percent, non-condensing.

WARRANTY

1.11 Provide a five year limited manufacturer's warranty on all room control devices and panels

MAINTENANCE

1.12 Spare Parts:

1.12.1 Provide 5% spares of each product to be used for this project. All unused items shall be boxed and delivered to the owner at the completion of the project.

PART 2 PRODUCTS

2.1 Acceptable Manufacturers: **WattStopper, or NLight**

Substitutions:

2.2 Bidder's wishing to obtain approval on manufacturers other than those specified in these specifications or on the drawings shall comply with the following procedures:

2.2.1 All substitution requests shall be submitted to the Architect / Engineer no less than 10 business days prior to the project bid opening date. Approvals when accepted will be issued in the form of an addendum to the contract. No consideration for substitutions will be provided after the award of the contract.

2.2.2 The substitution request must include a statement indicating how the substituted product may impact the completion of the project.

2.2.3 The substitution request must include a statement indicating the difference in price (both list price and Contractor price) between the specified product and the substitution.

2.2.4 The substitution request must include a detailed analysis indicating <u>any</u> differences between the specified product and the substitution.

2.2.5 Catalog literature for both the specified and the substitution shall be provided along with contact information of the manufacturer for the substituted product.

2.3 The contractor shall pay the Engineer (at their current standard hourly rates) for the time spent reviewing substitutions. These costs will be included as an addendum to be issued to all bidders to include in their proposals, and must be paid to the Engineer within 60 days of award of the project.

DIGITAL LIGHTING CONTROLS

2.4 Furnish the Company's system which accommodates the square-footage coverage requirements for each area controlled, utilizing room controllers, digital occupancy sensors, switches, daylighting sensors and accessories which suit the lighting and electrical system parameters.

DIGITAL WALL OR CELING MOUNTED OCCUPANCY SENSOR

2.5 Wall or ceiling mounted (to suit installation) passive infrared (PIR), ultrasonic or dual technology digital (passive infrared and ultrasonic) occupancy sensor

2.6 Digital Occupancy Sensors shall provide graphic LCD display for digital calibration and electronic documentation. Features include the following:

2.6.1 Digital calibration and pushbutton configuration for the following variables:

2.6.1.1 Sensitivity – 0-100% in 10% increments

2.6.1.2 Time delay – 1-30 minutes in 1 minute increments

2.6.1.3 Test mode – Five second time delay

2.6.1.4 Detection technology – PIR, Ultrasonic or Dual Technology activation and/or re-activation.

2.6.1.5 Walk-through mode

2.6.1.6 Load parameters including Auto/Manual-ON, blink warning, and daylight enable/disable when photo sensors are included in the DLM local network.

2.6.2 Programmable control functionality including:

2.6.2.1 Each sensor may be programmed to control specific loads within a local network.

2.6.2.2 Sensor shall be capable of activating one of 16 user-definable lighting scenes.

2.6.2.3 Adjustable retrigger time period for manual-on loads. Load will retrigger (turn on) automatically within a configurable period of time (default 10 seconds) after turning off

2.6.2.4 On dual technology sensors, independently configurable trigger modes are available for both Normal (NH) and After Hours (AH) time periods. The retrigger mode can be programmed to use the following technologies:

2.6.2.4.1 Ultrasonic and Passive Infrared

2.6.2.4.2 Ultrasonic or Passive Infrared

2.6.2.4.3 Ultrasonic only

2.6.2.4.4 Passive Infrared only

2.6.3 Independently configurable sensitivity settings for passive infrared and ultrasonic technologies (on dual technology sensors) for both Normal (NH) and After Hour (AH) time periods.

2.6.4 One or two RJ-45 port(s) for connection to DLM local network

2.6.5 Two-way infrared (IR) transceiver to allow remote programming through handheld commissioning tool and control by remote personal controls

2.6.6 Device Status LEDs, which may be disabled for selected applications, including:

2.6.6.1 PIR detection

2.6.6.2 Ultrasonic detection

2.6.6.3 Configuration mode

2.6.6.4 Load binding

2.6.7 Assignment of occupancy sensor to a specific load within the room without wiring or special tools

2.6.8 Manual override of controlled loads

2.6.9 All digital parameter data programmed into an individual occupancy sensor shall be retained in non-volatile FLASH memory within the sensor itself. Memory shall have an expected life of no less than 10 years

2.7 BACnet object information shall be available for the following objects:

2.7.1 Detection state

2.7.2 Occupancy sensor time delay

2.7.3 Occupancy sensor sensitivity, PIR and Ultrasonic

2.8 Units shall not have any dip switches or potentiometers for field settings

2.9 Multiple occupancy sensors may be installed in a room by simply connecting them to the free topology DLM local network. No additional configuration will be required.

2.10 WattStopper product numbers: LMPX, LMDX, LMPC, LMUC, LMDC

DIGITAL WALL SWITCHES

2.11 Low voltage momentary pushbutton switches in 1, 2, 3, 4, 5 and 8 button configuration. Wall switches shall include the following features:

2.11.1 Two-way infrared (IR) transceiver for use with personal and configuration remote controls.

2.11.2 Removable buttons for field replacement with engraved buttons and/or alternate color buttons. Button replacement may be completed without removing the switch from the wall.

2.11.3 Configuration LED on each switch that blinks to indicate data transmission.

2.11.4 Load/Scene Status LED on each switch button with the following characteristics:

2.11.4.1 Bi-level LED

2.11.4.2 Dim locator level indicates power to switch

2.11.4.3 Bright status level indicates that load or scene is active

2.11.5 Dimming switches shall include seven bi-level LEDs to indicate load levels using 14 steps

2.11.6 Programmable control functionality including

2.11.6.1 Button priority may be configured to any BACnet priority level, from 1-16, corresponding to networked operation allowing local actions to utilize life safety priority.

2.11.6.2 Scene patterns may be saved to any button other than dimming rockers. Once set, buttons may be digitally locked to prevent overwriting of the preset levels

2.11.7 All digital parameter data programmed into an individual wall switch shall be retained in non-volatile FLASH memory within the wall switch itself. Memory shall have an expected life of no less than 10 years

2.12 BACnet object information shall be available for the following objects:

2.12.1 Button state

2.12.2 Switch lock control

2.12.3 Switch lock status

2.13 Two RJ-45 ports for connection to DLM local network

2.14 Multiple digital wall switches may be installed in a room by simply connecting them to the free topology DLM local network. No additional configuration shall be required to achieve multi-way switching

2.15 The following switch attributes may be changed or selected using a wireless configuration tool:

2.15.1 Load and Scene button function may be reconfigured for individual buttons (from Load to Scene, and vice versa)

2.15.2 Individual button function may be configured to Toggle, On only or Off only.

2.15.3 Individual scenes may be locked to prevent unauthorized change.

2.15.4 Fade Up and Fade Down times for individual scenes may be adjusted from 0 seconds to 18 hours

2.15.5 Ramp rate may be adjusted for each dimmer switch.

2.15.6 Switch buttons may be bound to any load on a room controller and are not load type dependent; each button may be bound to multiple loads

2.16 WattStopper product numbers: LMSW-101, LMSW-102, LMSW-103, LMSW-104, LMSW-105, LMSW-108, LMDM-101. Available in white, light almond, ivory, grey, red and black; compatible with wall plates with decorator opening

HANDHELD REMOTE CONTROLS

2.17 Battery-operated handheld devices in 1, 2 and 5 button configurations for remote switching or dimming control. Remote controls shall include the following features:

2.17.1 Two-way infrared (IR) transceiver for line of sight communication with DLM local network within up to 30 feet

2.17.2 LED on each button confirms button press

2.17.3 Load buttons may be bound to any load on a room controller and are not load type dependent; each button may be bound to multiple loads

2.17.4 Inactivity timeout to save battery life

2.18 A wall mount holster and mounting hardware shall be included with each remote control

2.19 WattStopper part numbers: LMRH-101, LMRH-102, LMRH-105

DIGITAL PARTITION CONTROLS

2.20 Partition controls shall enable manual or automatic coordination of lighting controls in flexible spaces with up to four moveable walls by reconfiguring the connected digital switches and occupancy sensors

2.21 Four-button low voltage pushbutton switch for manual control.

2.21.1 Two-way infrared (IR) transceiver for use with configuration remote control.

2.21.2 Removable buttons for field replacement with engraved buttons and/or alternate color buttons. Button replacement may be completed without removing the switch from the wall

2.21.3 Configuration LED on each switch that blinks to indicate data transmission.

2.21.4 Each button represents one wall; Green button LED indicates status.

2.21.5 Two RJ-45 ports for connection to DLM local network.

2.22 WattStopper part number: LMPS-104. Available in white, light almond, ivory, grey and black; compatible with wall plates with decorator opening

2.23 Contact closure interface for automatic control via input from limit switches on movable walls (by others).

2.23.1 Operates on Class 2 power supplied by DLM local network.

2.23.2 Includes 24VDC output and four input terminals for maintained third party contract closure inputs.

2.23.2.1 Input max. sink/source current: 1-5Ma

2.23.2.2 Logic input signal voltage High: >18VDC

2.23.2.3 Logic input signal voltage Low: <2VDC

2.23.3 Four status LEDs under hinged cover indicate if walls are open or closed; supports LMPS-104 as remote status indicator.

2.23.4 Two RJ-45 ports for connection to DLM local network.

2.24 WattStopper part number: LMIO-102

DIGITAL DAYLIGHTING SENSORS

2.25 Digital daylighting sensors shall work with room controllers to provide automatic switching, bi-level, or tri-level or dimming daylight harvesting capabilities for any load type connected to a room controller. Daylighting sensors shall be interchangeable without the need for rewiring

2.25.1 Closed loop sensors measure the ambient light in the space and control a single lighting zone

2.25.2 Open loop sensors measure incoming daylight in the space, and are capable of controlling up to three lighting zones

2.25.3 Dual loop sensors measure both ambient and incoming daylight in the space to insure that proper light levels are maintained as changes to reflective materials are made in a single zone

2.26 Digital daylighting sensors shall include the following features:

2.26.1 The sensor's internal photodiode shall only measure light waves within the visible spectrum. The photodiode's spectral response curve shall closely match the entire photopic curve. The photodiode shall not measure energy in either the ultraviolet or infrared spectrums. The photocell shall have a sensitivity of less than 5% for any wavelengths less than 400 nanometers or greater than 700 nanometers

2.26.2 Sensor light level range shall be from 1-6,553 foot candles (fc).

2.26.3 The capability of ON/OFF, bi-level or tri-level switching, or dimming, for each controlled zone, depending on the selection of room controller(s) and load binding to room controller(s).

2.26.4 For switching daylight harvesting, the photo sensor shall provide a field-selectable deadband, or a separation, between the "ON Setpoint" and the "OFF Setpoint" that will prevent the lights from cycling excessively after they turn off.

2.26.5 For dimming daylight harvesting, the photo sensor shall provide the option, when the daylight contribution is sufficient, of turning lights off or dimming lights to a field-selectable minimum level

2.26.6 Photo sensors shall have a digital, independently configurable fade rate for both increasing and decreasing light level in units of percent per second.

2.26.7 Photo sensors shall provide adjustable cut-off time. Cut-off time is defined by the number of selected minutes the load is at the minimum output before the load turns off. Selectable range between 0-240 minutes including option to never cut-off

2.26.8 Optional wall switch override shall allow occupants to reduce lighting level to increase energy savings or, if permitted by system administrator, raise lighting levels for a selectable period of time or cycle of occupancy

2.26.9 Integral infrared (IR) transceiver for configuration and/or commissioning with a handheld configuration tool, to transmit detected light level to wireless configuration tool, and for communication with personal remote controls

2.26.10 Configuration LED status light on device that blinks to indicate data transmission

2.26.11 Status LED indicates test mode, override mode and load binding.

2.26.12 Recessed switch on device to turn controlled load(s) ON and OFF.

2.26.13 BACnet object information shall be available for the following daylighting sensor objects, based on the specific photocell's settings:

2.26.13.1 Day and night setpoints

2.26.13.2 Off time delay

2.26.13.3 On and off setpoints

2.26.13.4 Up top three setpoints

2.26.13.5 Operating mode – on/off, bi-level, tri-level or dimming

2.26.14 One RJ-45 port for connection to DLM local network

2.27 A choice of accessories to accommodate multiple mounting methods and building materials. The photo sensors may be mounted on a ceiling tile, skylight light well, suspended lighting fixture or back box. Standard tube photo sensors accommodate mounting materials from 0-0.62" thickness (LMLS-400, LMLS-500). Extended tube photo sensors accommodate mounting materials from 0.62"-1.25" thickness (LMLS-400-L, LMLS-500-L). Mounting brackets are compatible with J boxes (LMLS-MB1) and wall mounting (LMLS-MB2). LMLS-600 photo sensor to be mounted on included bracket below skylight well

2.28 Any load or group of load in the room can be assigned to a daylighting zone

2.29 Each load within a daylighting zone can be individually enabled or disabled for discrete control) load independence)

2.30 All digital parameter data programmed into a photo sensor shall be retained in non-volatile FLASH memory within the photosensor itself. Memory shall have an expected life of no less than 10 years

Closed loop digital photo sensors shall include the following additional features:

2.31 An internal photodiode that measures light in a 100-degree angle, cutting off the unwanted light from bright sources outside of this cone.

2.32 Automatic self-calibration, initiated from the photo sensor, a wireless configuration tool or a PC with appropriate software

2.33 Automatically establishes application-specific setpoints following self-calibration. For switching operation, an adequate deadband between the ON and OFF setpoints shall

prevent the lights from cycling; for dimming operation a sliding setpoint control algorithm with separate Day and Night setpoints shall prevent abrupt ramping of loads

2.34 WattStopper Product Number: LMLS-400, LMLS-400-L

Open loop digital photosensors shall include the following additional features:

2.35 An internal photodiode that measures light in a 60-degree angle cutting off the unwanted light from the interior of the room

2.36 Automatically establishes application-specific setpoints following manual calibration using a wireless configuration tool or a PC with appropriate software. For switching operation, an adequate deadband between the ON and OFF setpoints for each zone shall prevent the lights from cycling; for dimming operation, a proportional control algorithm shall maintain the design lighting level in each zone

2.37 Each of the three discrete daylight zones can include any non-overlapping group of loads in the room

2.38 WattStopper Product Number: LMLS-500, LMLS-500-L

Dual loop photo sensors shall include the following additional features:

2.39 Close loop portion of dual loop device must have an internal photodiode that measures light in a 100 degree angle, cutting off the unwanted light from sources outside.

2.40 Open loop portion of dual loop device must have an internal photodiode that can measure light in a 60 degree angle, cutting off the unwanted light from the interior of the room

2.41 Automatically establishes application-specific set-points following self-calibration. For switching operation, an adequate deadband between the ON and OFF setpoints shall prevent the lights from cycling; for dimming operation a sliding setpoint control algorithm with separate Day and Night setpoints shall prevent abrupt ramping of load

2.42 Device must reference closed loop photosensor information as a base line reference. The device must be able to analyze the open loop photosensor information to determine if an adjustment in light levels is require

2.43 Device must be able to automatically commission setpoints each night to provide adjustments to electrical lighting based on changes in overall lighting in the space due to changes in reflectance within the space or changes to daylight contribution based on seasonal changes

2.44 Device must include extendable mounting arm to properly position sensor within a skylight well

2.45 WattStopper product number LMLS-600

DIGITAL ROOM CONTROLLERS AND PLUG – LOAD CONTROLLERS

2.46 Digital controllers for lighting and plug loads automatically bind the room loads to the connected devices in the space without commissioning or the use of any tools. Room and plug load controllers shall be provided to match the room lighting and plug load control

requirements. The controllers will be simple to install, and will not have dip switches or potentiometers, or require special configuration for standard Plug n' Go applications. The control units will include the following features:

2.46.1 Automatic room configuration to the most energy-efficient sequence of operation based upon the devices in the room

2.46.2 Simple replacement – Using the default automatic configuration capabilities, a room controller may be replaced with an off-the-shelf

2.46.3 Multiple room controllers connected together in a local network must automatically prioritize each room controller, without requiring any configuration or setup, so that loads are sequentially assigned using room controller device ID's from highest to lowest

2.46.4 Device Status LEDs to indicate:

2.46.4.1 Data transmission

2.46.4.2 Device has power

2.46.4.3 Status for each load

2.46.4.4 Configuration status

2.46.5 Quick installation features including:

2.46.5.1 Standard junction box mounting

2.46.5.2 Quick low voltage connections using standard RJ-45 patch cable

2.46.6 Based on individual configuration, each load shall be capable of the following behavior on power up following the loss of normal power

2.46.6.1 Turn on to 100%

2.46.6.2 Remain off

2.46.6.3 Turn on to last level

2.46.7 Each load shall be configurable to operate in the following sequences based on occupancy:

2.46.7.1 Auto-on/Auto-off (Follow on and off)

2.46.7.2 Manual-on/Auto-off (Follow off only)

2.46.8 The priority of each load output shall be reversible, via digital configuration, so that on is off and off is on

2.46.9 BACnet object information shall be available for the following objects:

2.46.9.1 Load status

2.46.9.2 Electrical current

2.46.9.3 Total watts per controller

2.46.9.4 Schedule state – normal or after-hours

2.46.9.5 Demand response control and cap level

2.46.9.6 Room occupancy status

2.46.9.7 Total room lighting and plug loads watts

2.46.9.8 Total room watts/sq ft

2.46.9.9 Force on/off all loads

2.46.10 UL 2043 plenum rated

2.46.11 Manual override and LED indication for each load

2.46.12 Dual voltage (120/277 VAC, 60 Hz), or 347 VAC, 60 Hz (selected models only). 120/277 volt models rated for 20A total load, derating to 16A required for some dimmed loads (forward phase dimming); 347 volt models rated for 15A total load; plug load controllers carry application-specific UL 20 rating for receptacle control.

2.46.13 Zero cross circuitry each load

2.46.14 All digital parameter data programmed into an individual room controller or plug load controller shall be retained in non-volatile FLASH memory within the controller itself. Memory shall have an expected life of no less than 10 years.

2.47 On/Off Controllers shall include:

2.47.1 One or two relay configuration

2.47.2 Efficient 150 mA switching power supply

2.47.3 Three RJ-45 DLM local network ports with integral strain relief and dust cover

2.47.4 WattStopper product numbers: LMRC-101, LMRC-102

2.48 On/Off/Dimming enhanced Room Controllers shall include:

2.48.1 Real time current monitoring

2.48.2 Multiple relay configurations

2.48.2.1 One, two or three relays (LMRC-21 x series)

2.48.2.2 One or two relays (LMRC-22x series)

2.48.3 Efficient 250 mA switching power supply

2.48.4 Four RJ-45 DLM local network ports with integral strain relief and dust cover

2.48.5 Once dimming output per relay

2.48.5.1 0-10V Dimming - Where indicated, one 0-10 volt analog output per relay for control of compatible ballasts and LED drivers. The 0-10 volt output shall automatically open upon loss of power to the Room Controller to assure full light output from the controlled lighting. (LMRC-21x series)

2.48.5.2 Line Voltage, Forward Phase Dimming - Where indicated, one forward phase control line voltage dimming output per relay for control of compatible two-wire or three-wire ballasts, LED drivers, MLV, forward phase compatible ELV, neon/cold cathode and incandescent loads. (LMRC-22x series)

2.48.5.3 Each dimming output channel shall have an independently configurable minimum and maximum calibration trim level to set the dimming range to match the true dynamic range of the connected ballast or driver

2.48.5.4 The LED level indicators on bound dimming switches shall utilize this new maximum and minimum trim

2.48.5.5 Each dimming output channel shall have an independently configurable minimum and maximum trim level to set the dynamic range of the output within the new 0-100% dimming range defined by the minimum and maximum calibration trim

2.48.5.6 Calibration and trim levels must be set per output channel

2.48.5.7 Devices that set calibration or trim levels per controller are not acceptable

2.48.5.8 All configuration shall be digital. Devices that set calibration or trim levels per output channel via trim pots or dip-switches are not acceptable

2.48.6 Each load shall have an independently configurable preset on level for Normal Hours and After Hours events to allow different dimmed levels to be established at the start of both Normal Hours and After Hours events

2.48.7 Fade rates for dimming loads shall be specific to bound switch buttons, and the load shall maintain a default value for any bound buttons that do not specify a unique value

2.48.8 The following dimming attributes may be changed or selected using a wireless configuration tool:

2.48.8.1 Establish preset level for each load from 0-100%

2.48.8.2 Set high and low trim for each load

2.48.8.3 Set lamp burn in time for each load up to 100 hours

2.48.9 Override button for each load provides the following functions:

2.48.9.1 Press and release for on/off control

2.48.9.2 Press and hold for dimming control

2.49 WattStopper product numbers: LMRC-211, LRMC-212, LMRC-221, LMRC-222

2.50 Plug Load Room Controllers shall include the following:

2.50.1 One relay configuration with additional connection for unswitched load

2.50.2 Configurable additive time delay to extend plug load time delay beyond occupancy sensor time delay (e.g. a 10 minute additive delay in a space with a 20 minute occupancy sensor delay ensures that plug loads turn off 30 minutes after the space is vacated)

2.50.3 Factory default operation is Auto-on/Auto-off, based on occupancy

2.50.4 Real time current monitoring of both switched and un-switched load (LMPL-201 only)

2.50.5 Efficient switching power supply

2.50.5.1 150mA (LMPL-101)

2.50.5.2 250mA (LMPL-201)

2.50.6 RJ-45 DLM local network ports

2.50.6.1 Three RJ-45 ports (LMPL-101)

2.50.6.2 Four RJ-45 ports (LMPL-201)

2.51 Wattstopper product numbers: LMPL-101, LMPL-201

DLM LOCAL NETWORK (Room Network)

2.52 The DLM local network is a free topology lighting control physical connection and communication protocol designed to control a small area of a building

2.53 Features of the DLM local network include:

2.53.1 Plug n' Go® automatic configuration and binding of occupancy sensors, switches and lighting loads to the most energy-efficient sequence of operation based upon the device attached

2.53.2 Simple replacement of any device in the network with a standard off the shelf unit without requiring commissioning, configuration or setup

2.53.3 Push n' Learn® configuration to change the automatic configuration, including binding and load parameters without tools, using only the buttons on the digital devices in the local network

2.53.4 Two-way infrared communications for control by handheld remotes, and configuration by a handheld tool including adjusting load parameters, sensor configuration and binding, within a line of sight of up to 30 feet from a sensor, wall switch or IR receiver

2.54 Digital room devices connect to the local network using pre-terminated Cat 5e cables with RJ-45 connectors, which provide both data and power to room devices. Systems that utilize RJ-45 patch cords but do not provide serial communication data from individual end devices are not acceptable

2.55 If manufacturer's pre-terminated Cat 5e cables are not used for the installation, the contractor is responsible for testing each cable following installation and supplying manufacturer with test results

2.56 WattStopper Product Number: LMRJ-Series

CONFIGURATION TOOLS

2.57 A wireless configuration tool facilitates optional customization of DLM local networks using two-way infrared communications, while PC software connects to each local network via a USB interface

2.58 Features and functionality of the wireless configuration tool shall include but not be limited to:

2.58.1 Two-way infrared (IR) communication with DLM IR-enabled devices within a range of approximately 30 feet

2.58.2 High visibility organic LED (OLED) display, pushbutton user interface and menu-driven operation

2.58.3 Must be able to read and modify parameters for room controllers, occupancy sensors, wall switches, daylighting sensors, network bridges and relay panels, and identify room devices by type and serial number

2.58.4 Save up to eight occupancy sensor setting profiles, and apply profiles to selected sensors

2.58.5 Temporarily adjust light level of any load(s) on the local network, and incorporate those levels in scene setting. Set room mode for testing of Normal Hours (NH) and After Hours (AH) parameter settings

2.58.6 Adjust or fine-tune daylighting settings established during auto-configuration, and input light level data to complete configuration of open loop daylighting controls

2.58.7 Set room mode for testing of Normal Hours (NH) and After Hours (AH) parameter settings

2.58.8 Verify status of building level network devices

2.59 WattStopper Product Numbers: LMCT-100, LMCI-100/LMCS-100

PROGRAMMING, CONFIGUARION AND DOCUMENTATION SOFTWARE

2.60 PC-native application for optional programming of detailed technician-level parameter information for all DLM products, including all parameters not accessible via BACnet and the handled IR configuration tool. Software must be capable of accessing room-level parameter information locally within the room when connected via the optional LMCI-100 USB programming adapter, or globally for many segment networks simultaneously utilizing standard BACnet/IP communication. Additional parameters exposed through this method include but are not limited to:

2.60.1 Occupancy sensor detection LED disable for performance and other aesthetic spaces where blinking LEDs present a distraction.

2.60.2 Six occupancy sensor action behaviors for each controlled load, separately configurable for normal hours and after hours modes. Modes include: No Action, Follow Off Only, Follow On Only, Follow On and Off, Follow On Only with Override Time Delay, Follow Off Only with Blink Warn Grace Time, Follow On and Off with Blink Warn Grace Time.

2.60.3 Separate fade time adjustments per load for both normal and after hours from 0 - 4 hours.

2.60.4 Configurable occupancy sensor re-trigger grace period from 0 - 4 minutes separate for both normal hours and after hours.

2.60.5 Separate normal hours and after hours per-load button mode with modes including: Do nothing, on only, off only, on and off.

2.60.6 Load control polarity reversal so that on events turn loads off and vice versa.

2.60.7 Per-load DR (demand response) shed level in units of percent.

2.60.8 Load output pulse mode in increments of 1second.

2.60.9 Fade trip point for each load for normal hours and after hours that establishes the dimmer command level at which a switched load closes its relay to allow for staggered On of switched loads in response to a dimmer

2.61 Generation of reports at the whole file, partial file, or room level. Reports include but are not limited to:

2.61.1 Device list report: All devices in a project listed by type.

2.61.2 Load binding report: All load controller bindings showing interaction with sensors, switches, and daylighting.

2.61.3 BACnet points report: Per room Device ID report of the valid BACnet points for a given site's BOM.

2.61.4 Room summary report: Device manifest for each room, aggregated by common BOM, showing basic sequence of operations.

2.61.5 Device parameter report: Per-room lists of all configured parameters accessible via hand held IR programmer for use with O&M documentation.

2.61.6 Scene report: All project scene pattern values not left at defaults (i.e. 1 = all loads 100%, 2 = all loads 75%, 3 = all loads 50%, 4 = all loads 25%, 5-16 = same as scene 1).

2.61.7 Occupancy sensor report: Basic settings including time delay and sensitivity(ies) for all occupancy sensors

2.62 Network-wide programming of parameter data in a spreadsheet-like programming environment including but not limited to the following operations

2.62.1 Set, copy/paste an entire project site of sensor time delays.

2.62.2 Set, copy/paste an entire project site of sensor sensitivity settings.

2.62.3 Search based on room name and text labels.

2.62.4 Filter by product type (i.e. LMRC-212) to allow parameter set by product.

2.62.5 Filter by parameter value to search for product with specific configurations

2.63 Network-wide firmware upgrading remotely via the BACnet/IP network

2.63.1 Mass firmware update of entire rooms

2.63.2 Mass firmware update of specifically selected rooms or areas

2.63.3 Mass firmware upgrade of specific products

2.64 WattStopper Product Number: LMCS-100, LMCI-100

USER INTERFACE

2.65 Each lighting control panel system shall be supplied with at least (1) handheld configuration tool (LMCT-100). As a remote programming interface the configuration tool shall allow setup, configuration, and diagnostics of the panel without the need for software or connection of a computer. The user interface shall have the following panel-specific functions as a minimum:

2.65.1 Set network parameters including panel device ID, MS/TP MAC address, baud rate and max master range.

2.65.2 Relay Group creation of up to 99 groups. Group creation shall result in programming of all seven key relay parameters for member relays. The seven parameters are as follows: After-hours Override Time Delay, Normal Hours Override Time Delay, Action on Transition to Normal Hours, Action on Transition to After Hours, Sensor Action During Normal Hours, Sensor Action During After Hours, Blink-Warn Time for After Hours.

2.65.3 Program up to 254 separate scheduled events. Events shall occur on seven day intervals with each day selectable as active or inactive, and shall be configurable as to whether the event is active on holidays. Holidays are also defined through the User Interface.

2.65.4 Program up to 32 separate Dark/Light events. Events shall have a selectable source as either calculated Astro with delay, or a digital IO module with an integral 0-5V or 0-10V analog photocell. Dark/Light events shall occur on seven day intervals with each day selectable as active or inactive, and shall be configurable as to whether the event is active on holidays.

2.65.5 Button binding of digital switches to groups shall be accessible via the handheld IR remote and accomplished from the digital switch station.

2.65.6 Programming of panel location information shall be accomplished by the handheld IR remote and include at a minimum LAT, LON, DST zone, and an approximate city/state location.

2.65.7 An additional handheld IR remote may optionally be specified to be permanently mounted to the panel interior via a retractable anti-theft lanyard to allow for convenient programming of the panel while assuring that the handheld programmer is always present at that panel. An unlimited number of handheld IR remotes may also be purchased for facilities staff as determined by the end user's representative.

2.66 WattStopper Product Number: LMCT-100

PART 3 EXECUTION

PRE-INSTALLATION MEETING

3.1 A factory authorized manufacturer's representative shall provide the electrical contractor a functional overview of the lighting control system prior to installation. The contractor shall schedule the pre-installation site visit after receipt of approved submittals to review the following:

3.1.1 Confirm the location and mounting of all digital devices, with special attention to placement of occupancy and daylighting sensors.

3.1.2 Review the specifications for low voltage control wiring and termination.

3.1.3 Discuss the functionality and configuration of all products, including sequences of operation, per design requirements.

3.1.4 Discuss requirements for integration with other trades

CONTRACTOR INSTALLATOIN AND SERVICES

3.2 Contractor to install all devices and wiring in a professional manner. All line voltage connections to be tagged to indicate circuit and switched legs

3.3 Contractor to install all room/area devices using manufacturer's factory-tested Cat 5e cable with pre-terminated RJ-45 connectors. If pre-terminated cable is not used for room/area wiring, the contractor is responsible for testing each field-terminated cable following installation, and shall supply the lighting controls manufacturers with test results. Contractor to install any room to room network devices using manufacturer-

supplied LM-MSTP network wire. Network wire substitution is not permitted and may result in loss of product warranty per DLM SEGMENT NETWORK section of specification. Low voltage wiring topology must comply with manufacturer's specifications. Contractor shall route network wiring as shown in submittal drawings as closely as possible, and shall document final wiring location, routing and topology on as built drawings

3.4 Install the work of this Section in accordance with manufacturer's printed instructions unless otherwise indicated. Before start up, contractor shall test all devices to ensure proper communication

3.5 Calibrate all sensor time delays and sensitivity to guarantee proper detection of occupants and energy savings

3.5.1 Adjust time delay so that controlled area remains lighted while occupied

3.6 Provide written or computer-generated documentation on the configuration of the system including room by room description including:

3.6.1 Sensor parameters, time delays, sensitivities, and daylighting setpoints.

3.6.2 Sequence of operation, (e.g. manual ON, Auto OFF. etc.)

3.6.3 Load Parameters (e.g. blink warning, etc

3.7 1st - Post start-up tuning – After 30 days from occupancy contractor shall adjust sensor time delays and sensitivities to meet the Owner's requirements. Provide a detailed report to the Architect / Owner of post start-up activity

3.8 2nd - Post start-up tuning – After 180 days from occupancy contractor shall adjust sensor time delays and sensitivities to meet the Owner's requirements. Provide a detailed report to the Architect / Owner of post start-up activity

FACTORY SERVICES

3.9 Upon completion of the installation, the manufacturer's factory authorized representative shall start up and verify a complete fully functional system

3.10 The electrical contractor shall provide both the manufacturer and the electrical engineer with three weeks written notice of the system start up and adjustment date

3.11 Upon completion of the system start up, the factory-authorized technician shall provide the proper training to the owner's personnel on the adjustment and maintenance of the system

COMMISSIONING SUPPORT SERVICES

3.12 On this project, a commissioning agent will be hired to verify the installation and programming of all building systems, which includes the lighting control system. Manufacturer should include an extra day of technician's time to review the functionality and settings of the lighting control hardware with the commissioning agent, including reviewing submittal drawings and ensuring that instructions on how to configure each device are readily available. Manufacturer is NOT responsible for helping the commissioning agent inspect the individual devices. It will be the commissioning agent's

responsibility to create and complete any forms required for the commissioning process, although the manufacturer or contractor may offer spreadsheets and/or printouts to assist the agent with this task.

3.13 The commissioning agent shall work with the electrical contractor during installation of the lighting control hardware to become familiar with the specific products. The agent may also accompany the manufacturer's technicians during their start-up work to better understand the process of testing, calibration and configuration of the products. However, the contractor and manufacturer shall ensure that interfacing with the agent does not prevent them from completing the requirements outlined in the contract documents

ACCEPTANCE TESTING SUPPORT SERVICES

3.14 On all DSA reviewed projects, a certified lighting controls acceptance test technician (CLCATT) is not required.

END OF SECTION

SECTION 262726

SWITCHES AND RECEPTACLES

PART 1 GENERAL

1.1 Furnish and install all wiring devices as shown on drawings and as herein specified. Unless otherwise noted, device and plate numbers shown are Hubbell and shall be considered the minimum standard acceptable. Other acceptable manufacturers are Pass and Seymour, Leviton, General Electric and Bryant.

1.2 Submit manufacturers' data on all items.

1.3 **Common submittal mistakes which will result in the submittals being rejected:**

1.3.1 Not correctly indicating ampacity rating of proposed devices.

1.3.2 Not including all items listed in the above itemized description.

1.3.3 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.

1.3.4 Not including actual manufacturer's catalog information of proposed products.

1.3.5 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 PRODUCTS

2.1 All switches shall be of the quiet mechanical type, Specification Grade, 20 amp, 120/277 volt AC as follows:

	HUBBELL	LEVITON	PASS & SEYMOUR
Single Pole	CS120	CS1202	CS20AC1
Two Pole	CS1222	CS2202	CSB20AC2
Three-way	CS320	CS3202	CS20AC3
Key Switch	HBL1221L	1221-2L	PS20AC1-L

2.2 All switches shall have the "on" and the "off" position indicated on the handle. If switches of higher ampere ratings are required, they shall be of similar type and quality as those shown above. Groups of switches shown at one location shall be installed under a single plate up to a maximum of six where more than six switches are shown coordinate arrangement with the Architect.

2.3 Dimmer switches for incandescent lamp loads shall be square-law type, slide control dimmer with OFF position, Lutron or Hubbell "Nova-T" Series NT-600 (0-500 watt load), NT-1000 (501-900 watt load), NT-1500 (901-1500 watt load), or equal (no known equal).

2.4 All convenience receptacles and special outlets throughout shall be grounding type. Convenience receptacles shall be side wired, parallel slot, two pole, three wire, 20 amp as follows:

	HUBBELL	LEVITON	PASS & SEYMOUR
Duplex	5352	5362	PS5362
GFCI	GFR5362	7899	2097
Isolated Ground	IG5362	5362IG	IG6300
Tamper Proof		8300SG	TR63H

2.5 All safety or tamper proof receptacles shall have no exposed external current carrying metal parts, and shall have integral wiring leads suitable for two or three wire installations.

2.6 Special receptacles shall be as noted on the drawings.

2.7 Weatherproof plates shall be designed to meet CEC Article 410-57, wet location listed with cover "open." Where weatherproof receptacles have been identified to be provided with locking covers, the cover shall be as manufactured by Pass & Seymour #4600-8 or Cole Lighting 310 Series. Rough-in requirements vary between manufacturers. Contractor to field verify requirements prior to installation.

2.8 All plates throughout shall be stainless steel. Where wiring devices are installed in concrete block walls, provide oversized 3-1/2" x 5" coverplates.

2.9 All devices shall be white unless otherwise noted or a special purpose outlet.

2.10 Unless where specifically detailed on the drawings, floor boxes shall be PVC suitable for concrete poured floors of minimum 3-1/2" depth, with a modular design to gang two or three sections together.

2.10.1 Carlon #E976 series or approved equal

2.10.2 Provide brass cover with brass carpet flange unless otherwise detailed.

PART 3 EXECUTION

3.1 All receptacles and line voltage switches shall be labeled on faceplate utilizing white Dymo-Tape with black lettering. Labeling format shall be ‘XX-YY’. XX represents panel name and YY represents circuit number. Labels shall be placed below the top faceplate fastener and above the top edge of faceplate opening. In no circumstance shall they overlap the fastener or the receptacle.

3.2 Switches for room lighting shall be located no more than 12" center line from door jamb at plus 48" center line above finished floor or +46" to top of devices where located over casework, reference CBC Figure 11B-5D.

3.3 All receptacles shall be mounted at plus 18" to center line above finished floor unless noted or shown otherwise. All receptacles shall be installed with the ground pin up, at the top of the receptacle to comply with IEEE 602-1986.

3.4 Furnish and install wall plates for all wiring devices, and outlet boxes, including special outlets, sound, communication, signal, and telephone outlets, etc. as required. All cover plates shall be appropriate for type of device.

END OF SECTION

OFFICE IMPROVEMENTS
Descanso Elementary School

SECTION 265113

LED LIGHTING FIXTURES AND LAMPS

PART 1 GENERAL

1.1 Furnish and install all lighting fixtures with lamps as specified and as shown on the drawings. Fixtures shall be complete including canopies, hanger, diffusers, ballasts, etc.

1.2 Submit manufacturer's data for each fixture type including the following:

1.2.1 Lighting fixture catalog data and photometry.
1.2.2 Lamp catalog data for each fixture type.
1.2.3 Driver catalog data for each fixture type.
1.2.4 Fixture warranty.

1.3 <u>Common submittal mistakes which will result in the submittal being rejected:</u>

1.3.1 Not including lamp and driver information for each fixture type.

1.3.2 Not including all items listed in the above itemized description.

1.3.3 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.

1.3.4 Not including actual manufacturer’s catalog information of proposed products.

1.3.5 Do not include multiple manufacturers for similar products and do not indicate “or approved equal” statements, or “to be determined later” statements. The products being submitted must be the products installed.

PRODUCT SUBSTITUTION

1.4 All substitutions or alternate fixtures to those indicated on the project fixture schedule shall be submitted for approval (7) business days prior to the project bid date. Approvals <u>when</u> accepted will be issued in the form of an addendum. No consideration for substitutions will be provided after the award of the contract.

1.4.1 The substitution request must include a statement indicating the difference in price of both the specified and alternate product, both contractor and list price. The substitution request must include a comparison of the total fixture wattage, total fixture lumens, fixture efficiency and warranty comparison.

1.4.2 When proposing to substitute lighting fixture and/or fixture retrofit, a point by point photometric calculation of a typical application as used in this project shall be included. A calculation of the specified and the proposed alternate shall be included.

PART 2 PRODUCTS

2.1 All catalog numbers are given for manufacturer's identification and shall not relieve Contractor from responsibility of full conformance to all applicable written description requirements governing material and fabrication, either in the general or specific sections. Where catalog numbers are indicated as modified, no modification will be required if the

standard unit fully conforms to descriptive requirements in the Specifications and matches specified ceiling.

2.2 All fixtures of the same type shall be of one manufacturer and of identical finish and appearance. All fixtures and component parts shall bear the UL label.

2.3 All steel parts shall be phosphate treated in multistage power spray system for corrosion resistance and paint adhesion. Final finish shall be electrostatically applied baked white enamel of not less than 87 pct. reflectance on reflecting surfaces.

2.4 Each fixture shall have a continuous light-seal gasket seated in such manner as to prevent any light leak through any portion or around any edge of the trim frame.

2.5 Diffusers shall be framed in a hinged, continuous assembly. Diffuser frame latches shall be spring-loaded or cam-operated.

2.6 All recessed fixtures shall be provided with frames appropriate for the type of ceiling involved. No fixtures shall be ordered until the ceiling construction has been verified by the Contractor.

MINIMUM LUMINARY REQUIREMENTS

2.7 Electrical Components, Devices and Accessories: Listed and labeled as defined in NFPA 70 by a qualified testing agency, and marked for intended location and application.

2.8 Recessed Fixtures: Comply with NEMA LE 4.

2.9 CRI of **minimum 80 CCT of 4100 K**.

2.10 Rated lamp life of 50,000 hours minimum.

2.11 Lamps dimmable from 100 percent to 0 percent of maximum light output.

2.12 Nominal Operating Voltage: **120 V / 277 V ac**

PART 3 EXECUTION

3.1 All lighting fixtures shall be supported as follows:

3.1.1 From the outlet box by means of a metal strap where its weight is less than five pounds.

3.1.2 From its outlet box by means of a hickey or other threaded connection where its weight is from five to fifty pounds.

3.1.3 Directly from the structural slab or joists where its weight exceeds fifty pounds.

3.1.4 Lighting fixtures shall be supported independent of the ceiling system or additional ceiling support must be added to carry the weight of the lighting fixtures. Recessed lighting fixtures supported from ceiling grid tees shall be furnished with hold down clips in conformance with CEC 410 - 16, spring clips will not be permitted. All fixtures which the manufacturer has not provided UL approved clips, must be attached to the fixture and ceiling grid by metal screws.

3.2 Furnish and install supplementary blocking and support as required to support fixture from structural members. Contractor shall submit proposed blocking method for all suspended lighting fixtures for approval prior to rough in.

3.3 Suspended and/or pendant mounted fixtures shall be provided with four aircraft safety cables extending in opposite directions, attached to the fixture, and supported from a structural member. The contractor shall submit proposed fixture mounting and aircraft cable attachment methods for approval prior to fixture rough in.

3.4 Class 1 wiring to the fixture must be installed either conduit or type MC-PCS cabling no open wiring shall be permitted.

3.5 Chain suspension may be used only where specifically permitted on the drawings. Chain shall be heavy duty, nickel or cadmium plated, suitable for weight of specific fixture.

3.6 Shop drawings shall be furnished for each fixture type. Catalog cuts, illustrating conformance with specifications, will be acceptable for standard units. Shop drawings shall indicate materials, assembly, finish and dimensions.

3.7 Photometric data shall be furnished for any fixture substituted for those listed on the schedule.

3.8 Any driver which produces a greater than normal amount of noise shall be replaced by the contractor. Normal will be determined by the level of sound produced by other similar fixtures operating in the area.

END OF SECTION

SECTION 269090

TESTING

PART 1 GENERAL

1.1 Upon completion of the electrical work, the entire installation shall be tested by the Contractor, and demonstrated to be operating satisfactorily to the Architect, Engineer, Inspector and Owner.

1.2 All testing and corrections shall be made prior to demonstration of operation to the Architect, Engineer, Inspector and Owner.

1.3 In addition to the demonstration of operation, the Contractor is also required to review the content and quality of instructions provided on items demonstrated with the Architect, Engineer, Inspector and Owner.

PART 2 EXECUTION

2.1 Wiring shall be tested for continuity, short circuits and/or accidental grounds. All systems shall be entirely free from “grounds,” “short circuits,” and any or all defects.

2.2 Motors shall be operating in proper rotations, and control devices functioning properly. Check all motor controllers to determine that properly sized overload devices are installed, and all other electrical equipment for proper operation.

2.3 Tests and adjustments shall be made prior to acceptance of the electrical installation by the Architect, and a certificate of inspection and acceptance of the electrical installation by local inspection authorities shall be provided.

2.4 All equipment or wiring provided which tests prove to be defective or operating improperly shall be corrected or replaced promptly, at no additional cost to the Owner.

2.5 Test all motor and feeder circuits with a “megger” tester to determine that insulation values conform to Section 110-20, California Electrical Code (CED). Test reports must be submitted and approved by the engineer before final acceptance.

2.6 Test all grounding electrode connections to assure a resistance of no more than 10 ohms is achieved. Augment grounding until the ohmic value stated above is achieved. Provide certified test results to the Architect, Engineer and Inspector.

END OF SECTION

SECTION 270100

COMMUNICATIONS GENERAL PROVISIONS

PART 1 SUMMARY

1.1 This Division of the specifications outlines the provisions of the contract work to be performed as a sub contract under the Division 26 scope of work. Reference the Division 26 Electrical General Provisions for scope of work and general requirements.

1.2 In addition, work in this Division is governed by the provisions of the bidding requirements, contract forms, general conditions and all sections under Division 1 requirements.

END OF SECTION

OFFICE IMPROVEMENTS
Descanso Elementary School

SECTION 271000

VOICE / DATA / IP INTERCOM INFRASTRUCTURE

PART 1 GENERAL

1.1 Include all labor, equipment and materials necessary for providing a complete networking infrastructure system as described herein and/or as indicated on the drawings.

1.2 Related specification sections:

1.2.1 Section 26 01 00 - General Provisions
1.2.2 Section 26 05 19 - Conductors
1.2.3 Section 26 05 33 - Conduit and Fittings
1.2.4 Section 26 05 34 – Outlet and Junction Boxes

1.3 Approved minimum Product and Contractor Extended Warranty Certifications;

1.3.1 All components shall be manufactured by one of approved manufacturers, the installing Contractor must have the accompanying certification from the product manufacturer(s) for installation of a “Extended Warranted System” as required by each manufacturer and as indicated in these specifications.

1.3.1.1 Specified system warranties are to be established between the component and cable manufacturers and the District, warranties between the cable manufacturer only or installing Contractor and the District are not considered equal.

1.3.1.2 Warranty shall be a full “Performance Warranty” installed by a “Certified Contractor” as specified by one of the approved manufacturer’s. A “Component Warranty” will not be considered equal. All components, labor, and “Performance Criteria" shall be warranted by one of the approved manufacturers;

1.4 Acceptable manufacturers are:

1.4.1 **LEVITON / BERK-TEK**

1.4.1.1 Installing Contractor must be LEVITON Network Solutions Premier certified to install this system.

1.4.1.2 Warranty provision and training must be for the Levition/Berk-Tek – Limited Lifetime Premium Performance Warranty program.

1.4.2 COMMSCOPE

1.4.2.1 Commscope’s Training and Warranty programs encompass the brand names known as Systimax and Uniprise.

1.4.2.2 Installing Contractor must be PartnerPro certified to install any of the systems under the Commscope Family of brand names. Alternate certification that apply as well is Systimax Premier Certification for products installed with the Systimax brand name.

1.4.2.3 Warranty provision and training must be for the Commscope (Uniprise and Systimax) – 25-Year Premium Performance Warranty program.

1.4.3 **ORTRONICS (Legrand)/Superior Essex**

1.4.3.1 Installing Contractor must be CIP-ESP or CIP certified to install this system.

1.4.3.2 Warranty provision and training must be for the nCompass – Lifetime Premium Performance program.

1.4.4 Warranty shall be to the District, for the period as defined by the Network Infrastructure System selected for installation, after District acceptance and sign-off of the completed system. The Contractor must provide documentation from one of the approved manufacturers, as indicated in Section 1.3, indicating their qualifications for installation of this system in compliance with the manufacturer's warranty period requirements as a warranted Contractor.

1.4.5 Equipment qualifications: It is the intent of these specifications that each bidder provides all hardware, components and installation services that are necessary to ensure a fully operational wiring system including warranties, as shown in the EIA/TIA Category-6 guidelines.

1.4.6 All components, parts, infrastructure, patch cables, termination panels and cables must be classified by the manufacturer or manufacturers as a part of the "Extended Warranty" program. Contractor may not mix in components from other certified programs or materials that are not considered part of the "Lifetime" warranty.

1.4.7 Systems or components as manufactured by any other manufacturer which, are not specifically listed in 1.3, are **not** approved for use on this project..

1.5 **Installing Contractor qualifications:** Firms and their personnel must be regularly engaged in the installation of data networking cabling and equipment for systems of similar type and scope. The Contractor must have a full-service office able to respond to emergency callouts during the warranty period. The Contractor must also provide complete installation of all wiring and devices or equipment. **Subcontracts with Electrical Contractors or other warranted or non-warranted Contractors for supervised installation of any part of this system are not approved.**

1.5.1 Contractor shall have on staff a minimum of (1) BICSI RCDD on staff as full-time employees.

1.5.2 The successful Contractor shall be a California licensed C7 or C10 Premise Wiring Contractor as defined in this specification.

1.5.3 All work shall be performed under the supervision of a company accredited and trained by the Manufacturer of the components and cable and such accreditation must be presented with the bid submittal. All personnel performing work on this project must have successfully completed the manufacturer's training courses to completely comply with the extended warranty requirements prior to performance of any work on this project. Accreditation will consist of individual employee certifications issued by the manufacturer or manufacturers.

1.5.4 All personnel engaged in the testing of premises fiber optic and copper UTP cable systems must have successfully completed the test equipment manufacturer's training courses. Certification of such training must be presented

with the bid submittal. Cut sheets of the test equipment to be utilized shall be provided with the Phase I project material submittals.

1.5.5 **This project shall employ Category-6 cabling. The Contractor shall install the related components in relation to the performance requirements for the type of cable installed**.

1.5.6 If Contractor routes cables and/or associated pathways in another route than indicated on the drawings, they shall maintain all maximum cable installation distances as required by the manufacturer's distance limitations.

1.6 In order to ensure project cohesion, a single point of contact is required to provide a "TURNKEY" solution. The work covered under this section of the specification consists of furnishing all; labor; cabling; equipment; supplies; materials, and training. The Contractor will perform all operations necessary for the "TURNKEY" and fully completed installation in accordance with the specifications herein. As such, the successful Contractor must be factory trained on all aspects of Network Infrastructure Cabling System.

1.7 The drawings indicate a schematic routing of cables above ceilings. The Contractor shall field-verify the most appropriate routing of all above-ceiling cable prior to bid. Where cables penetrate through walls a conduit sleeve shall be provided. Where cables pass through fire rated walls, the conduit sleeve shall be sealed to maintain the rating of the wall assembly.

1.8 Unless otherwise noted in the project drawings or these specifications, the Division 26 Contractor shall provide the installation of all conduits, outlet and junction boxes, trenching and pull box installation.

1.9 General Submittal Requirements

1.9.1 **Phase I Submittal** shall be made in electronic format within (20) working days after the award of the contract by the District. This submittal shall include the following:

1.9.1.1 Complete Bill of Materials in Excel Spreadsheet format with bills of quantities, including all materials, components, devices, and equipment required for the work. The bills of quantities shall be tabulated respective of each and every system as specified, and shall contain the following information for each Section listed:

1.9.1.2 Description and quantity of each product.

1.9.1.3 Manufacturer's Name and Model Number.

1.9.1.4 Manufacturer's Specification Sheet or Cut Sheet.

1.9.1.5 Specification Item Number referenced for each required product or if not shown in the specifications, Drawing Detail Number being referenced. (ie; Spec. 271000 Item 2.1 or DWG E4.15/#1)

1.9.1.6 Include with submittals all warranty information and a description of support and maintenance services to be provided. Also include all licenses and maintenance agreements required for continued operation of the equipment.

1.9.2 **Phase II Submittal** shall be provided within (20) working days after the approval of the Phase I submittals and prior to any fabrication or field conduit installations. All shop drawings shall be engineered in a CAD Software. Submission shall include electronic print copies to match the contract drawings, and Phase II submittals drawings shall include the following.

1.9.2.1 MDF and IDF equipment rack or cabinet elevations will be required to be provided including cable routing, grounding, support, UPS, network electronics, etc. and position of all components in the rack or cabinet.

1.9.2.2 Provide labeling plan which identifies the proposed scheme for identifying all components including Racks, patch panels (fiber and copper), site distribution feed cables, horizontal station cables and site conduit systems (handholes, pullboxes,etc.).

1.9.2.3 Provide shop drawings showing all end device locations, tap values, paging zones and amplifier sizing for each zone for analog speakers and horns, including devices connected to IP-Based zone controllers.

1.9.3 Common submittal mistakes which will result in submittals being rejected:

1.9.3.1 Not including the qualifications of the installing Contractor Company and Contractor's Staff.

1.9.3.2 Not including all items listed in the above itemized description.

1.9.3.3 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed (provided for the project) or crossing out the items which are not applicable.

1.9.3.4 Not including actual manufacturer's cut sheets or catalog information of proposed products.

1.9.3.5 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

1.9.4 The Contractor shall make a written request directly to Johnson Consulting Engineers for electronic drawing files (CAD). As a part of the written request, please include the following information:

1.9.4.1 Clearly indicate Project Name and Client, Johnson Consulting Job Number (located in bottom left corner of JCE Engineering Stamp) and each drawing Sheet Number required (i.e., E1.1, E2.1, E4.1 etc.).

1.9.4.2 Identify the name, Company, Title, phone number, mailing address and e-mail address of the person to receive the files.

1.9.4.3 Detail or Riser diagram sheets, System Schematic drawings or any other drawings other than floor plans or site plans, will not be made available to the Contractor.

1.9.4.4 Files will only be provided in the AutoCAD format in which they were created (i.e., version 2015 or version 2016). Files will not be made available in REVIT format.

1.9.4.5 Requests for files will be processed as soon as possible; a minimum of 7 working days should be the normal processing time. The Contractor shall be completely responsible for requesting the files in time for their use and delays in requesting files will not alleviate the Contractor from submitting required documents within the required timeline.

PART 2 PRODUCTS

Main Distribution Frame (MDF)

2.1 The Main Distribution Frame shall be the central wiring and equipment location for the infrastructure systems. The MDF is EXISTING.

Intermediate Distribution Frame (IDF)

2.2 The Intermediate Distribution Frame shall be a secondary wiring and equipment location for the data networking system. The contractor shall include the following items at this location.

2.2.1 Category-6 Modular Patch Panels (rack mounted) with RJ45 style connectors, for terminating all twisted pair cable from each Voice/Data/IP-Page device outlet served from this location. Provide 25% spare capacity for future wiring requirements. All patch panels shall be 24 or 48-ports maximum. Provide cable support bars at the rear of each patch panel. All cable shall be secured to bars with Velcro straps.

2.2.2 Additional items required at each IDF closet are as follows:

2.2.2.1 Fiber patch cords shall be provided and connected to the electronics by others.

2.2.2.2 Provide (blue) Category-6 (patch panel end) patch cords with pre-molded boot, provide quantity equal to 100% of the total data cable drop or port provided. Verify with Customer all ports which will be activated. All patch cords to be installed by contractor. Allow for 100% of total copper patch cords required to be (9) inches in length. Patch cords shall be in compliance with the manufacturer's "Channel" warranty requirements.

2.2.2.3 Provide (blue) Category-6 (workstation end) patch cords with pre-molded boot, provide quantity equal to 100% of the total data cable drops or ports provided. Verify with Customer all ports which will be activated. All patch cords to be installed by contractor. Provide for 10% of total copper patch cords required to be (10) feet in length and all remaining patch cords shall be (15) feet in length. Patch cords shall be in compliance with the manufacturer's "Channel" warranty requirements.

2.2.2.4 Provide all other items as detailed on the drawings.

2.3 **Voice /Data/Access Point/ IP Intercom Station Cable**

2.3.1 Provide one Category-6, 4-pair, unshielded twisted pair (UTP) cable from the nearest MDF or IDF to each RJ45 data outlet port indicated on the drawings. Dual port outlets will require two such cables. Four port outlets will require four cables.

2.3.2 Category 6 cables shall be copper wire, individually insulated and color coded.

2.3.3 The cables shall be UL or ETL rated and UL verified in compliance with proposed Category-6.

2.3.4 The cables shall be UL or ETL rated and UL verified in compliance with proposed Category-6.

Superior Essex	–	NextGain Cat 6eX - #54-246-xA
Commscope	_	CS37R
Berk-Tek	_	Lanmark 2000 series

2.3.5 Where data cables are indicated to run underground, contractor shall use a Category-6 flooded cable: Comm Scope - Ultra Media Series - #6NF4.

2.3.6 (**Blue**) cables for all data specific cables

2.3.7 (**Grey**) cables for all IP intercom specific cables.

2.3.8 (**Black**) cables for all Access Point Locations

2.3.9 (**Red**) cables for all Video Surveillance locations

2.4 **Voice /Data/Access Point Outlets**

2.4.1 Unshielded twisted pair data outlets shall be an RJ45 Enhanced performance type 8-position / 8 conductor modular jacks, and shall comply with proposed Category-6 performance requirements, single port, dual port or four port as noted on drawings. All outlets shall be wired in an EIA/TIA 568B configuration.

2.4.2 Fiber optic local origination outlets shall be SC Duplex type inserts and shall occupy the same faceplate as the data outlets.

2.4.3 Category-6 UTP local origination outlets shall be of the same type and manufacture as the data outlets. Refer to drawings for faceplate configurations.

2.4.4 For single port data outlet or single port voice outlet locations, the faceplates shall have space for two connections with one port fully operational for connection to all of the specified protocols. The second port shall be covered by a blank plate.

2.4.5 For dual port data, dual port voice, or dual port voice/data outlet locations, the faceplates shall have space for two connections with both ports fully operational for connection to all of the specified protocols.

2.4.6 For triple port data outlet or any combination of voice and data totaling three ports, the faceplates shall have space for four connections with three ports fully

operational for connection to all of the specified protocols. The fourth port shall be covered by a blank plate.

2.4.7 For quad port data outlet or any combination of voice and data totaling four ports, the faceplates shall have space for four connections with all four ports fully operational for connection to all of the specified protocols.

2.4.8 For dual port data outlet locations with local origination, the faceplates shall have space for four connections with all ports fully operational for connection to all of the specified protocols. The fourth port shall be covered by a blank plate.

2.4.9 For single port voice outlet locations intended for wall telephone connections, a wall telephone type faceplate with attachment studs shall be provided. The wall telephone jack shall be 8-pin, RJ45 type and use IDC wire terminations only. Screw terminal type jacks will not be accepted as an alternative.

2.4.10 All data outlet faceplates shall be (white) and shall have a unique sequential identification number applied to faceplate. Hand written labels are not permitted. Faceplates, with the exception of wall telephone outlets, shall include interchangeable colored icons or color coded port inserts. All color schemes shall be approved by the customer prior to installation.

2.4.11 Reference the drawings for special outlet configurations or plate requirements.

2.5 IP Paging Speakers/Horns

2.5.1 The Contractor shall furnish and install the IP based paging speakers and horns.

2.5.2 Data Contractor shall be responsible for providing enclosures for all IP based speakers and horns. Contractor shall provide vandal resistant screws with all enclosures for attachment of the speaker/horn baffle. Exterior locations shall be provided with stainless steel vandal resistant screws.

2.5.3 Flush mount enclosures shall be furnished and installed by the 27 10 00 Contractor in all areas shown in the floor plans.

2.5.4 **Paging speakers and enclosures will be O.F.C.I.**

2.5.5 Provide a (2) foot long, CAT-6, UTP patch cord, gray in color, for the speaker location to connect to the ethernet drop located in the enclosure. Provide patch cords for 100% of IP Speaker/horn locations. Provide (10) spare patch cords, deliver all Patch cords to the District IT Department.

2.5.6 IP speakers/horns shall be connected to the powered ethernet switch in the MDF / IDF Room or cabinet. Provide 4-foot long, Category-6 UTP patch cords, gray in color. Provide patch cords for 100% of IP Speaker/horn/zone controller locations. Provide (20) spare patch cords, deliver all Patch cords to the District IT Department.

2.5.7 All speaker connections to be terminated at the data patch panel. Speakers must be patched to a powered switch in the IDF to allow for proper operation.

2.5.8 Contractor for 27 10 00 section is responsible for providing licensing requirements and Informacast software to drive speakers and program tones, bell schedules and announcement controls.

2.5.9 Programming of speakers for page coverage zones, tones, time schedules, pass class bell and VoIP interface to be completed by 27 10 00 contractor and is also responsible for providing IP addressing and identification of individual speakers.

2.5.10 Contractor shall provide server for this system and all associated programming.

2.5.10.1 HP DL360 G9 E5-2620V3, E6-2620V3, 16GB, SAS, P44OAR cont w/2G

2.5.10.2 HP 300GB SAS 12G 10K HOD

2.5.10.3 HP Lights out ADV License 3 year

2.5.10.4 HP Smart Cache License

PART 3 INSTALLATION

3.1 Upon completion of 10% of the cabling installation, the contractor shall notify the engineer for an inspection of the methods and types of materials used on the project. The contractor shall give a minimum of 72 hours notification to the engineer for the inspection. The contractor will be given a written review of the findings, so if adjustments are required, they can be done before the project proceeds.

3.2 Pull strings will be provided with all cable runs including but not limited to; conduit stub ups, conduit sleeves, cable trays, open wiring routes, innerduct, and point-to-point conduits. Pull strings shall be free from cable bundles in open wiring routes. Pull strings shall not be substituted for pull ropes.

3.3 Velcro cable management straps are required on all Category-6 cable bundles, the last 20 feet or upon entry into equipment closet, a maximum of 12" apart. Cable bundles shall also be routed through cable management or “D” rings in the equipment closet.

3.4 Data contractor shall supply protective bushings or slide on rings at the ends of all exposed conduits used for the data system cabling. This is to include all conduits installed for any future data cabling requirements. Contractor shall submit planned protection bushing prior to installation of cabling for approval.

3.5 Velcro cable management straps are required on the rear of the equipment racks and on the patch cords within the vertical cable managers. Straps shall be a maximum of 12" apart.

3.6 Labeling

3.6.1 Each cable run **shall be permanently labeled at each end** with a unique sequential number which corresponds to a similar number provided for each data outlet and punch down point. A printed label shall be placed at each of the following locations;

3.6.1.1 On the cable at the rear of the patch panel or termination block. Requires the use of a self laminating wrap around label. Brady Label self laminating 1.2" by 1.5" wrap around label Part # 29689 or equal.

3.6.1.2 On each cable in the j-box behind the faceplate location. Requires the use of a self laminating wrap around label. Brady Label self laminating 1.2" by 1.5" wrap around label Part # 29689 or equal.

3.6.1.3 On the face of the patch panel, provide a 3/4" by 3/4" label with a letter or number identifying the patch panel designation.

3.6.1.4 On the face of the faceplate in the label holder window.

3.6.2 Hand written labels are not permitted. Where cable ID includes room number identification the contractor shall obtain written verification of actual room numbers prior to beginning labeling (numbers on plans do not always match actual room numbers). Cable pulling cross reference lists will not be accepted with final documentation.

3.6.3 Each patch panel port shall be identified with a unique sequential labeling scheme. Port identification labeling pattern shall be consistent throughout the project.

3.6.4 All faceplates shall be identified with permanent printed labels. Labels must not be subject to removal by incidental contact. **Contractor shall be responsible for replacing defective labeling for a period of one year from date of final sign-off of project.**

3.6.5 All fiber optic and UTP feed cables shall be identified with a permanent, water resistant, printed labels. Labeling information shall include closet identifications, quantity of conductors (UTP) or strands (fiber) and house pair designations (UTP).

3.6.6 Labeling will follow recommended EIA/TIA standards or as requested by the customer. Contractor will confirm labeling pattern prior to final identification or testing. **All test results will be identified by the final labeling scheme.**

3.6.7 All fiber optic cables and/or innerduct shall be tagged with fiber optic warning tags in every manhole or pullbox. Fiber warning tags shall also be placed at each end of the cable in the termination closets in clear view. A minimum of (3) tags are required at each end. Fiber warning tags shall be placed on fiber optic cable and/or innerduct routed through open ceiling environments at increments no less than 15 feet apart.

3.7 Where open wiring cables are run through the ceiling space (only permitted where specifically noted on the drawings), the wire shall be bundled together and supported above the ceiling.

3.8 All cables must be fastened to the building structure via “j-hooks” or an approved Category 6 suspension system, and not directly in contact with ceiling system. For “j-hooks” maximum fill capacity is as follows: 1-5/16" hooks – 35 cables; 2" hooks - 60 cables; 4" hooks - 120 cables. For quantities beyond 120 cables use a sling support system such as “Erico Cable Cat” or equal. Maximum fill capacity 200 cables. **D-rings, “Caddy #WMX cable hangar”, “Caddy Bridle Rings”, drive rings or any other type of wire ring support is not allowed.**

3.9 Where cables pass through a fire-resistant portion of the structure, conduit sleeves shall be provided to maintain the rating of the wall penetrated. Sealing of all penetrations with an approved fire barrier is required. Conduits and sleeves must remain accessible for future use. Permanent sealants may not be used to seal sleeves and conduits.

3.10 Fiber optic cables connecting to equipment racks shall be installed with not less than 20 feet of slack cable between the rack and the terminal backboard. See drawings for fiber optic service loop requirements.

3.11 **Provide 6 inches of cable slack at computer data system outlets inside conduit box.**

3.12 In an accessible ceiling area, **provide a 10 foot (circle 8 configuration) service loop above the data/voice outlet** locations. Service loop must be tied up off of ceiling tiles or ceiling surface. Neatly coil cable without exceeding minimum bend radius limitations. **Do not provide length in excess of 15 feet. May cause improper test results.**

3.13 The minimum bending radius for all cables and the maximum pulling tension shall not exceed manufacturer's recommendations.

3.14 Cables installed in manholes and pullboxes on terminal backboards shall be installed on wall mounted cable support racks.

3.15 Provide a full 360 degree loop of cable around manhole and pullbox interiors.

3.16 Cable pulling shall use a split mesh grip over the cable jacket. Connection directly to optical fibers and copper wire conductors shall not occur.

3.17 When pulled through conduits, cable pulling lubricants shall be continuously applied to all cables and be specifically approved by the manufacturer.

3.18 Where cables are pulled through or pulled from a center of run, pull without splices or terminations, lead out the cables at all manholes, pullboxes, and conduits, taking care to feed them in again by hand for the next run.

3.19 For each cable pull where a cable direction change is required, flexible feed-in tubes, pullout devices, multi-segmented sheaves, etc., shall be used to ensure proper cable pulling tensions and side wall pressures. Cables shall not be pulled directly around a short right angle bend. Any device or surface the cable comes in contact with when under pull-in tension shall have a minimum radius 50% greater than the final specified minimum installed cable bending radius. The maximum possible size radius sheaves and feed-in tubes, usable in the available working space, shall be provided in all situations, to ensure the minimum possible cable sidewall pulling pressure. Do not use devices with multi-segment "roller" type sheaves.

3.20 Cable lengths over 250 feet shall be machine pulled, not hand pulled. Cables shall be pulled in a continuous, smooth operation without jerking or stop-start motion after initiation of pull. Maximum cable pulling speed shall be less than 50 feet per minute. Minimum pulling speed shall be greater than 15 feet per minute.

3.21 When pulling cable through conduit, cables shall be pulled straight into or out of the raceway without bends at the raceway entrance or exit. Pull in cable from the end having the sharpest bend (i.e., bend shall be closest to the reel.) Keep pulling tension to minimum by liberal use of lubricant, hand turning of reel, and slack feeding of cable into duct entrance. Employ not less than one man at reel and one at manhole or pullbox during this operation. Cables shall be pulled directly from cable reels.

3.22 All cables shall be new and extend continuous from each MDF or IDF backboard or rack to all voice/data outlets or other equipment locations.

3.23 Where cables are not installed in a conduit or other raceway system, they shall not be routed parallel with other line voltage equipment or wiring (120 volt and above) within 36" or within 12" of line voltage equipment or wiring where crossing. Where Flooded Enhanced Category-5 cables or outdoor rated fiber optic cables are routed exposed through ceilings for more than 50'-0", install in innerduct or EMT conduit system.

PART 4 TESTING

4.1 All Category-6 cables shall be point to point (link) tested after installation/termination, and verified to operate at minimum 1000Mbps. Performance of installed cables shall satisfy all current addendums to the EIA/TIA 568A standard for Category-6 wiring. In addition, testing shall satisfy all proposed amendments to the existing ISO/IEC requirements. The wiring shall support all specified communication protocols. Testing shall support the Category-6 requirements by the EIA/TIA.

4.2 **Upon completion of testing cable links, the Contractor shall supply a copy of the original database files downloaded from the tester in original format on disk. Contractor shall provide with database files an original copy of the tester's manufacturer software program (included in original cost) for record management and archiving, in a Windows format (e.g., MicroTest's software program - ScanLink ver.**

4.2.1 **10 PC for Windows, WaveTek's software program-LTRM ver.1.07, etc). The manufacturer's software program will be used by the engineer to review all test results, and then turned over to the customer to keep as their record copy with the final approved test results. Provide (3) copies of tests on disk.**

4.3 Contractor will repair or replace cable runs or connecting hardware that do not meet specified criteria.

4.4 **Upon completion of submittal of original test results, and after review and approval of those results, the contractor shall provide testing equipment and personnel to randomly re-test 10% or 20 drops minimum, whichever is greater, of all UTP cable locations on the campus in the presence of the designated customer representative and project engineer. The customer representative shall choose which cables are to be retested. If 10% of the re-tested cables fail to match the previously submitted original tests, the contractor must hire an independent testing firm to re-test all UTP cable on the campus, at no cost to the customer. All cables which do not meet the specifications criteria as determined by the independent test report, shall be replaced and retested by the contractor at no cost to the customer. Final sign-off of the testing shall be approved after receipt of all other documentation.**

4.5 **Special testing**

4.5.1 **The Owner will furnish and install all active networking electronic components. After the electronics have been installed the Contractor will provide for an independent test of the complete system. This test may include Active or Dynamic testing of all infrastructure components. The contractor will be required to repair any portions of the infrastructure system and or replace any components which do not meet the manufacturer's performance criteria.**

4.6 Multimode fiber optic cables shall be tested bi-directionally at 850nm and 1300nm. Single mode fiber optic cable shall be tested bi-directionally at 1310nm and 1550nm. All fiber strands shall be tested with a power meter and light source as well as an OTDR (Optical Time Domain Reflectometer). OTDR fiber tests for runs under 100 meters are not required. All fiber test results shall contain final source and destination information that matches IDF or MDF labeling shown on drawings. Fiber test results shall be submitted as PDF and editable electronic copy.

4.7 Test procedures shall comply with EIA/TIA 526-14 Method B. Test results shall meet the minimum following criteria:

4.7.1 Fiber optic test results shall not exceed 2db attenuation loss in addition to inherent loss published by manufacturer tested at minimum 2000 Mhz for 850nm and 500 Mhz for 1300nm for the fiber optic cable.

4.7.2 Test all voice/data cables minimum Category-6 UTP cable to test results for “Link Testing” requirements @ 250 Mhz per current EIA/TIA draft requirements. Any cables which do not meet these minimum requirements shall be replaced or repaired at no cost to the customer.

4.8 End to end attenuation termination points measure the power loss between end points from both directions.

4.9 End to end attenuation testing shall be performed with a temporary test jumper cable at each end of the installed fiber cable. The test jumper shall be the same size as the installed cable. The measured attenuation of the test jumpers, test connectors, and test interconnection sleeve between the two test jumpers shall be less than 1dB as calibrated at the time of the test at indicated wave lengths and frequencies.

4.10 **Provide (3) hard bound copies of “E-size” drawings and (1) disk copy in AutoCAD format and Visio 2013 copy of floor plan drawings of each building. These drawings shall include all outlet locations, major cable routes and outlet and cable identification numbers. Provide detailed elevations of each MDF or IDF locating all equipment and connections**.

4.10.1 The contractor shall also provide As-Built documentation of all existing data and voice outlets in each building. Contractor shall be responsible for documenting the location of the outlets, port count, voice or data and existing label designations on faceplates. The Contractor will not be responsible for testing existing locations or confirming the label ID information on existing outlets.

4.10.2 Provide detailed elevations of each MDF and IDF closet or cabinet reflecting the complete rack equipment and components. This is to include all existing equipment as well as new equipment added by the Contractor for this project.

END OF SECTION

SECTION 280100

ELECTRONIC SAFETY AND SECURITY
GENERAL PROVISIONS

PART 1 SUMMARY

1.1 This Division of the specifications outlines the provisions of the contract work to be performed as a sub contract under the Division 26 scope of work. Reference the Division 26 Electrical General Provisions for scope of work and general requirements.

1.2 In addition, work in this Division is governed by the provisions of the bidding requirements, contract forms, general conditions and all sections under Division 1 requirements.

END OF SECTION

SECTION 281600

ACCESS CONTROL

PART 1 GENERAL

1.1 Summary

1.1.1 Field installed wired or wireless door access control equipment connections and field installed cabling connecting all components, basic programming, and licensing of all components on site and providing a direct Ethernet connection to the District Central Station door access control network.

1.2 Related Specification Sections:

1.2.1 26 05 33 – Conduit and Fittings

1.2.2 26 05 13 or 26 05 19 – Conductors

1.2.3 26 05 34 – Outlet and Junction Boxes

1.2.4 Division 8 – Door Hardware

1.3 Definitions

1.3.1 Wi-Fi: Wireless Communication (802.15.4 – ZigBee)

1.3.2 WAN: Wide area network.

1.3.3 LAN: Local area network

1.3.4 POE: Power Over Ethernet

1.3.5 PIM: Panel Interface Module

1.4 Installer Qualifications:

1.4.1 The installer must be factory trained and certified by the access control equipment manufacturer; and must have a minimum of Seven (7) years installation experience with the manufacturer's products.

1.4.2 The installing contractor may not use sub-contractors for installing any part of the system. All wiring terminations of any kind, device or equipment installations and programming must be done by a certified access control certified contractor. Known certified installers are:

1.4.3 Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.4.4 Comply with NFPA 70, "National Electrical Code."

1.5 General Submittal Requirements

1.5.1 **Phase I Submittal** shall be made in electronic format within (20) working days after the award of the contract by the District. This submittal shall include the following:

1.5.1.1 Complete Bill of Materials in Excel Spreadsheet format with bills of quantities, including all materials, components, devices, and equipment required for the work. The bills of quantities shall be tabulated respective of each and every system as specified, and shall contain the following information for each Section listed:

1.5.1.2 Description and quantity of each product.

1.5.1.3 Manufacturer's Name and Model Number.

1.5.1.4 Material Cut Sheets shall provide detailed product information and shall be original manufacturer product bulletins. Copies of material information from vendor websites shall not be considered equal and will not be accepted.

1.5.1.5 Material Cut Sheet part number provided shall be highlighted or provided with an arrow directed at the corresponding part number.

1.5.1.6 Specification Item Number referenced for each required product or if not shown in the specifications, Drawing Detail Number being referenced. (ie; Spec. 281600 Item 2.1 or DWG E4.15/#1)

1.5.1.7 Include with submittals all warranty information and a description of support and maintenance services to be provided. Also include all licenses and maintenance agreements required for continued operation of the equipment.

1.5.2 **Phase II Submittal** shall be provided within (20) working days after the approval of the Phase I submittals and prior to any fabrication or field conduit installations. All shop drawings shall be engineered in a CAD Software. Submission shall include electronic print copies to match the contract drawings, and Phase II submittals drawings shall include the following:

1.5.2.1 Complete floor plans showing the locations throughout the project of all receptacles, conduits, wireways, tray, pullboxes, junction boxes, equipment locations, and other devices.

1.5.2.2 Typical system riser diagrams, specialty equipment or rack elevations will be required to be provided.

1.5.3 Common submittal mistakes which will result in submittals being rejected:

1.5.3.1 Not including the qualifications of the installing Contractor Company and Contractor’s Staff.

1.5.3.2 Not including all items listed in the above itemized description.

1.5.3.3 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed (provided for the project) or crossing out the items which are not applicable.

1.5.3.4 Not including actual manufacturer's cut sheets or catalog information of proposed products.

1.5.3.5 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

1.5.4 The Contractor shall make a written request directly to Johnson Consulting Engineers for electronic drawing files (CAD). As a part of the written request, please include the following information:

1.5.5 Clearly indicate Project Name and Client, Johnson Consulting Job Number (located in bottom left corner of JCE Engineering Stamp) and each drawing Sheet Number required (i.e., E1.1, E2.1, E4.1 etc.).

1.5.5.1 Identify the name, Company, Title, phone number, mailing address and e-mail address of the person to receive the files.

1.5.5.2 Detail or Riser diagram sheets, System Schematic drawings or any other drawings other than floor plans or site plans, will not be made available to the Contractor.

1.5.5.3 Files will only be provided in the AutoCAD format in which they were created (i.e., version 2015 or version 2016). Files will not be made available in REVIT format.

1.5.5.4 Requests for files will be processed as soon as possible; a minimum of 7 working days should be the normal processing time. The Contractor shall be completely responsible for requesting the files in time for their use and delays in requesting files will not alleviate the Contractor from submitting required documents within the required timeline

1.6 Warranty

1.6.1 Special Warranty: Manufacturer's standard form in which manufacturer and installer agree to repair or replace components of access control devices and equipment that fail in materials or workmanship with specified warranty period.

1.6.2 Warranty Period: (Two years) from date of Substantial Completion

1.6.3 The warranty shall cover all costs for service, including parts.

1.6.4 On-site support shall be provided by the Access Control Contractor.

1.6.5 Software version upgrades shall be available at no charge during the warranty period.

1.6.5.1 All software related licensing, support agreements and control operational licenses to be provide for a period of Two (2) years.

PART 2 PRODUCTS

ACCEPTABLE MANUFACTURER

2.1 Open Path Cloud Control Software/Avigilon – to match existing district systems

2.2 Substitutions: No Approved Alternate

2.3 The system shall provide for wired readers to secure perimeter doors where shown on the floor plans.

2.4 The system shall be centrally managed by the existing district single database/software application and one single credential system for all doors in the System.

2.5 Basic System Performance Requirements

2.5.1 Shall provide central management of user rights, access policies, and credentialing through the existing District system.

2.5.2 The application shall be capable of implementing access policies through the assignment of entry permission based on door groupings and time schedules.

2.6 System and Software

2.6.1 Provide Open Path/Avigilon software licenses for each Proximity/Card Reader installed. Coordinate installation and programming of Access Control Systems with the District IT and Facilities Departments.

2.7 Equipment

2.7.1 Control Panels, Wired Card/Proximity Readers, REX Motion Detectors and Door Contacts an shall be provided by the 28 16 00 Contractor as shown in the Drawing Details and as noted in these specifications. Refer to the Drawing Details for the Wiring Diagrams detailing the required components.

2.7.2 Provide 24V 4-Door Avigilon Core Series Smart Hub Controller Panel Model #4ENT-SYS-24V in the IDF Closet or Control Panel Location with:

2.7.2.1 Internet connectivity to the Openpath access control cloud for system management and communication

2.7.2.2 Stores all cloud configurations locally in order to remain fully functional in the event of an Internet outage

2.7.2.3 Standard RS-485 signaling to communicate with Openpath readers over CAT 5/6 wiring

2.7.2.4 Port interfaces for 4 Relays, 4 Openpath Readers, 4 REX Sensors, and 4 Contact Sensors

2.7.2.5 2 auxiliary relays and 4 configurable auxiliary input pins provide extra outputs and allow additional sensors or Wiegand devices

2.7.2.6 Operating Voltage: 12-24VDC

2.7.2.7 Operating Current: 1.25A @ 24VDC (with 4 Openpath Readers) 0.7A @ 24VDC (with no readers)

2.7.2.8 Door Relays: 4 relays, 5A @ 24VDC (resistive)

2.7.2.9 Auxiliary Relays: 2 relays, 1A @ 24VDC

2.7.2.10 Openpath Readers: Up to 4 Openpath Readers

2.7.2.11 REX and Contact Sensors: 4 REX and 4 contact sensor inputs with EOL monitoring, nominal 5VDC, 1kohm to each input

2.7.2.12 Auxiliary Inputs: 4 input lines with EOL monitoring

2.7.2.13 Enclosure Size: 14” H, 12” W, 4.5” D (356 x 305 x 114 mm)

2.7.2.14 Weight: Approx 10 lbs (4.5 kg)

2.7.2.15 Communication Ports: 10/100 BaseT Ethernet, USB port

2.7.2.16 Backup Battery: Use two 12VDC sealed lead acid (SLA) or gel cell batteries in series

2.7.3 Provide Avigilon Models #OP-R2X-STND Standard Proximity Card Reader or #OP-R2X-MULL Mullion Mounted Proximity Card Reader licensed for use with Open Path/Avigilon software per the Drawing Details.

2.7.3.1 Provide standard RS-485 cabling to the Proximity Card Readers from the Control Panel

2.7.3.2 Proximity Card Readers shall be mounted on the junction box by the

2.7.3.3 Contractor shall upsize all conductors for long cable runs to compensate for voltage drop loss as required. Standard cabling Shielded RS485 w/22AWG Conductors. Use one twisted pair for GND and VIN (power) and one twisted pair for +B and -A (data). Provide size of conductors based on manufacturer’s recommendations and distance of cable runs.

2.7.4 Provide Von Duprin Model #ELRX99L Electric Panic Hardware. Including Von Duprin Model #PS914 2RS Power Supply for Door.

2.7.5 Request-To-Exit Motion Sensor at the Door

2.7.6 All wired electric locks shall be furnished and installed by the Div. 8 Contractor. Reference Division 8 Specification for Door Type. Reference Architectural Drawings for Door Schedule. Electronic Door Locks and Electric Panic Hardware Furnished and programmed by Division 28. Electric Hardware installed by Division 8.

2.7.7 The 28 16 00 Contractor shall be responsible for installation of all cabling from the Door locations to the Control Panels in the IDF Room or Cabinet locations.

2.8 Wire and Cable - Cabling shall be as required for system operation or as shown in the specifications and detail drawings. Refer to the floor plans for additional requirements.

2.8.1 Proximity/Card Reader Cable - Provide minimum RS-485 (10) conductor, 22-AWG, Thermoplastic coated stranded bare copper conductors with 100% Overall Aluminum Polyester Foil Shield, 24-AWG Stranded Tinned Copper Drain Wire, PVC jacketed, Riser-rated (CMR) cable for Proximity Cared Reader locations within the building.

2.8.2 Interior Riser Rated REX Motion Detector Cable - Provide (4) conductor, 22-AWG, Thermoplastic coated stranded bare copper conductors with 100% Overall Aluminum Polyester Foil Shield, 24-AWG Stranded Tinned Copper Drain Wire, PVC jacketed, Riser-rated (CMR) cable for REX Detector locations within a building. Provide West Penn Part #3241 or Approved Equal.

2.8.3 Interior Riser Rated Electric/Panic Hardware Cable - Provide (2) conductor, 18-AWG, Polyethylene coated stranded tinned copper conductors with 100% Overall Aluminum Polyester Foil Shield, 20-AWG Stranded Tinned Copper Drain Wire, PVC jacketed, Riser-rated (CMR) cable for Electric/Panic Hardware locations within a building. Provide West Penn Part #77293.

2.8.4 Interior Riser Rated Door Contact Cable - Provide (2) conductor, 22-AWG, Polypropylene coated stranded bare copper conductors with PVC jacketed, Riser-rated cable for door contact locations within a building. Provide Honeywell Part #2102 or West Penn Part #221.

2.8.5 All cables shall be permanently labeled with a permanent type-written label showing a unique cable number a minimum of two locations, one within 6” and one 24” from the point of termination at the end of the cable.

2.8.6 Provide other items as shown in the drawings or specifications

PART 3 EXECUTION

3.1 Examine pathway elements intended for cables. Check raceways, cable trays, and other elements for compliance with space allocations, installation tolerances, hazards to cable installation, and other conditions affecting installation.

3.2 Examine roughing-in for cable-connected devices to verify actual locations of conduit and back boxes before device installation.

3.3 Proceed with installation only after unsatisfactory conditions have been corrected.

3.4 Comply with NECA 1, "Good Workmanship in Electrical Construction."

3.5 Wiring Method: Install wiring in raceway and/or cable tray as indicated on Drawings except within consoles, cabinets, desks, and counters. Conceal raceway and wiring except in unfinished spaces.

3.6 Boxes and enclosures containing security-system components or cabling, shall not be installed in locations which are easily accessible to employees or to the public boxes

above ceiling level in occupied areas of the building shall not be considered accessible. Junction boxes and small device enclosures below ceiling level and easily accessible to employees or the public shall be covered with a suitable cover plate and secured with tamperproof screws.

3.7 Unit shall be mounted on a properly prepared surface adequate for the size and weight of the module. The placement of the unit shall allow provision for installation and maintenance as indicated on the approved detail drawings and in accordance with the installation manual.

3.8 Comply with Section 26 05 26 "Grounding and Bonding for Electrical Systems."

3.9 Comply with IEEE 1100, "Recommended Practice for Power and Grounding Electronic Equipment."

3.10 PREPARATION

3.10.1 Coordinate with Owner Representative for all IP address, network switch ports and permissions, Firewall settings and other Owner Supplied LAN equipment and settings required for an operational PACS

3.10.2 Verity any Owner provided equipment, or network infrastructure meets, or exceeds manufacturer’s requirements.

3.11 INSTALLATION

3.11.1 Prior to hardware installation, the General Contractor shall setup a meeting with the Door Hardware Supplier, Installer, and this Contractor to ensure all understand the manufacturer’s installation requirements for all items

3.11.2 All equipment shall be installed to comply with manufacturer's written instructions. Where cutting and fitting are required, the contractor shall insure that all such preparation is done to minimize cosmetic impact. If installation requiring cutting onto or into surfaces that are later to be painted or finished, the contractor shall coordinate removal, storage, and reinstallation of surface protective trim units (trim rings, etc.), as required. Do not install surface-mounted items until finishes have been completed on substrates involved

3.11.3 Wireless Integrated Locksets. commission Wireless Integrated Locksets using the appropriate Wireless Access devices: PIMs, GWE’s or Wi-Fi Access Points. Coordinate with Owner’s LAN/WAN support for all Network Switch and POE connections. Ethernet and other associated cables for the Wireless Integrated Locksets shall be the responsibility of the Division 28 contractor

3.12 FIELD QUALITY CONTROL

3.12.1 Perform final inspection with hardware installer and hardware supplier present to ensure correct installation and operation and check for damaged or defective items before installing additional devices. Observe and inspect that all hardware has been installed to its correct destination in proper working order.

3.12.2 The contractor will perform at least one test of the system after commissioning with the Owner and General Contractor present to confirm problem-free operation and compliance with the design specifications in this Section.

3.13 ADJUSTING

3.13.1 Initial Survey: Check each operating item of door hardware and each door to ensure proper operation or function of every unit. Report items out of adjustment, or that do not operate as intended to General Contractor

3.13.2 Ensure all openings have been adjusted properly prior to commissioning and system testing

3.13.3 At completion of the installation and prior to Substantial Completion, final adjustments should be made to all devices. Leave all hardware clean and fully operable. Should an item be found to be defective, it shall be repaired or replaced as directed

3.14 CLEANING AND PROTECTION

3.14.1 Clean adjacent surfaces soiled by the installation.

3.14.2 Clean operating items as necessary to restore proper finish.

3.14.3 Provide final protection and maintain conditions that ensure all hardware is without damage or deterioration at time of Substantial Completion

3.15 DEMONSTRATION & TRAINING

3.15.1 Provide a minimum of four (2) hours of software instruction to Owner's Personnel in proper setup and operation of the system at final installation

3.15.2 In addition to instruction, after the system is installed and adjusted, the contractor shall demonstrate the functionality and proper use to Owner's Personnel of the system.

END OF SECTION

OFFICE IMPROVEMENTS
Descanso Elementary School

SECTION 282305

IP- BASED VIDEO CALL STATION SYSTEM

PART 1 GENERAL

1.1 The Contractor shall provide new IP-Based Video Call Station System for controlled access to the School Campus as shown on the drawings, and as described in these specifications including all mounting hardware, connectors, power supplies, and auxiliary equipment as may be required as specified herein and required by the District Facilities Department to meet all their requirements.

1.2 Related Specification Sections:

1.2.1 Section 26 01 00 - General Provisions

1.2.2 Section 26 05 33 – Raceways and Boxes

1.2.3 Section 26 05 19 – Low Voltage Electric Power Conductors and Cables

1.3 The system shall provide two-way video and audio communications capabilities. The system will be used at specific locations shown on the drawings to alert the School Administrative Office of Non-District Personnel requiring controlled access to the School Campus. The system needs to include the following functionality;

1.3.1 Two-Way Voice Communications

1.3.2 Controlled Access at designated Door Locations

1.3.3 Two-Way Video and Camera Surveillance at Door Locations

1.4 In summary, the system is a single unit comprised of multiple components. It shall provide interoperability in cases of emergency and direct communication to the School Administrative Offices and any other entity as directed by the District Facilities Department. The system must be expandable to address future development. In addition, the system shall be able to withstand the rigors of the outside elements.

1.5 Required Functions:

1.5.1 The requirement here is to provide a self-contained IP-Based Video Call Station wherein the following safety and security services are housed;

1.5.1.1 Direct access two-way communications appliance mounted at Door

1.5.1.2 Video camera in Vandal-Resistant Housing

1.5.1.3 Door Release of Electronic Door Hardware with Audio Notification (buzzer)

1.5.1.4 Direct two-Way communications with IP-Based Video Attendant Master Station at Administrative Office Reception

1.6 The IP-Based Video Call Station must be weather-resistant and designed to withstand the outside elements. The other safety and security services are described below.

1.7 Direct Access Communications - Direct access to the Administrative Office Reception for Video and Voice Communications is required. The IP-Based Video Call Station shall contain a VOIP Call Station that is activated with a single button and upon activation make a direct connection to the Campus Administrative Office Reception Desk at the Master Station. The VOIP Call Station must be housed in an unbreakable, tamper-resistant appliance designed to withstand the outside elements and to be installed on adjacent Building Wall. Operation of the VOIP Call Station must be simple and obvious and upon activation, the IP-Based Video Call Station and the immediate area around the User must be fully viewed at the IP-Based Video Attendant Master Station.

1.8 IP-Based Video Call Station specifications;

1.8.1 Ethernet I/F: 10/100 BaseTX Ethernet

1.8.2 Supported Protocols: IPv4, HTTPS, TCP, UDP, RTP, SIP, RTCP, and DHCP Compliant

1.8.3 Power Input: PoE IEEE802.3af – Class ‘0’ Compliant or 19–27 VDC, dedicated line-regulated power supply – Idle: 4W; Maximum: 8W

1.8.4 Regulatory Compliance: FCC Class A, UL 60950

1.8.5 ADA/Accessibility: (2010) Standards for Accessible Design: ANSI ICC A117.1; (2009) Accessible and Usable Buildings and Facilities

1.9 Video Surveillance Camera at IP-Based Video Call Station – Cameras will be integrated into the faceplate of the Video Call Station. The cameras shall serve multiple purposes:

1.9.1 The camera will target the area directly in front of the IP-Based Video Call Station identifying the Caller and the immediate surrounding area upon activation of the direct dial VOIP phone station. The camera shall be installed recessed inside the Front Panel above the built-in Speaker and Call Button. Refer to the detail drawings for additional information on location of the camera.

1.9.2 The cameras will provide a short duration live feed to the Administrative Office Reception location, designated by the School Principal, on the campus for monitoring of the Entrance Doors to the School Campus.

1.9.3 The Contractor shall be responsible for installation, set-up and programming of the Video Call Station and Video Attendant Master Station. Coordinate the installation with the District’s IT and Facilities Departments Contacts.

Quality Assurance

1.10 All items of equipment shall be designed by the manufacturer to function as a complete system. All phone installation, configurations, setup, programming and related work shall be performed by electronic technicians thoroughly trained by the manufacturer in the installation and service of the equipment provided.

1.11 All equipment shall be warrantied against any defects in material and workmanship under normal use for a period of twenty-four (24) months from date of installation, provided that manufacturer receives a completed "Installation Certification" certifying the date on which the system has been installed. An "Installation Certification" card shall be enclosed with

every unit. In the event that no "Installation Certification" is received by manufacturer, the twenty four (24) months will commence on the date of shipment by the manufacturer.

1.12 The Contractor shall be an established Contractor that has had and currently maintains a locally run and operated business for at least five years. The Contractor shall utilize a duly authorized distributor of the equipment supplied for this project location with full manufacturer's warranty privileges.

1.13 Installation of IP-Based Video Call Station and Master Station shall be furnished by a factory authorized Contractor and Distributor. The Contractor shall hold a C10 or C7 license from the State of California for the purpose of installing Low Voltage Systems. The Contractor shall meet the requirement of the 28 23 05 Section for warranted installations.

1.13.1 Subcontractors shall be approved for the installation of the Data Infrastructure portion of the IP-Based Video Call Station System only. All other portions of the installation of the IP-Based Video Call Station System shall be provided by an Authorized Installation company. Refer to the IP-Based Video Call Station Wiring Diagram for additional requirements.

1.14 The following Contractor's are authorized dealers and installers for the specified IP-Based Video Call Stations in Southern California;

1.14.1 Electro Specialty Systems (ESS Systems) - Office (XXX)

1.14.2 Simplex Grinnell – George Honaker, (619) 249-5192, e-mail – ghonaker@simplexgrinnell.com

1.14.3 American Security Group – Preston Gregory, Office (760) 727-4020, Cell (760) 525-4899, e-mail – pgregory@amergroup.com

1.14.4 Standard Electronics – Brett Budvarson – brettb@standardelectronics.us, 619-520-8510, 613 W. Main St. El Cajon Ca 92020

1.15 The Contractor shall show satisfactory evidence, upon request, that the supplier maintains a fully equipped service organization capable of furnishing adequate inspection and service to the system. The supplier shall maintain at this facility the necessary spare parts in the proper proportion as recommended by the manufacturer to maintain and service the equipment being supplied.

1.16 Electrical Component Standard: Provide work complying with applicable requirements of CEC with state amendments including, but not limited to:

1.16.1 Article 250, Grounding.
1.16.2 Article 300, Part A. Wiring Method.
1.16.3 Article 310, Conductors for General Wiring.
1.16.4 Article 725, Remote Control, Signaling Circuits.
1.16.5 Article 800, Communication Systems.

1.17 UL Compliance: Comply with requirements of UL 50. The communication system supplied shall be listed by Underwriter's Laboratories under UL Standard 1459. A copy of the UL listing card for the proposed system shall be included with the Contractor's submittal. The system shall also comply with PCC Part 68 Regulations.

1.18 Installation and start up of all systems shall be under the direct supervision of a local agency regularly engaged in installation, repair, and maintenance of such systems. The supplier shall be accredited by the proposed equipment manufacturers and be prepared to offer a service contract for system maintenance on completion of the guarantee period.

1.19 The agency providing equipment shall be responsible for providing all specified equipment and mentioned services for all equipment as specified herein. The agency must be a local authorized distributor of the specified equipment for single source of responsibility and shall provide documents proving such. The agency must provide written proof that the agency is adequately staffed with factory-trained technicians for the specified equipment.

1.20 The Contractor shall guarantee availability of local service by factory-trained personnel of all specified equipment from an authorized distributor of all equipment specified under this section. On-premises maintenance shall be provided at no cost to the purchaser for a period of two (2) years from date of installation unless damage or failure is caused by misuse, abuse, neglect, or accident.

1.21 Deliver products in factory containers. Store in clean, dry space in original containers. Protect products from fumes and construction traffic. Handle carefully to avoid damage.

1.22 The unit shall be warranted for a period of two (2) years. Reference manufacturer's warranty for further details.

Support

1.23 Telephone Support: Free telephone support must be provided during normal business hours from the Manufacturer and Authorized Contractor.

Submittals

1.24 **Phase I Submittal** shall be made in electronic format within (20) working days after the award of the contract by the District. This submittal shall include the following:

1.24.1 Manufacturer's authorization and Training Certifications required in the specifications for the Contractor and/or company personnel.

1.24.2 Complete Bill of Materials in Excel Spreadsheet format with bills of quantities, including all materials, components, devices, and equipment required for the work. The bills of quantities shall be tabulated respective of each and every system as specified, and shall contain the following information for each Section listed:

1.24.2.1 Description and quantity of each product.

1.24.2.2 Manufacturer's Name and Model Number.

1.24.2.3 Manufacturer's Specification Sheet or Cut Sheet.

1.24.3 Specification Item Number referenced for each required product or if not shown in the specifications, Drawing Detail Number being referenced. (ie; Spec. 28 23 05 Item 2.1 or DWG E4.15/#1, etc.)

1.24.4 Include with submittals all warranty information and a description of support and maintenance services to be provided. Also include all licenses and maintenance agreements required for continued operation of the equipment.

1.25 **Phase II Submittal** shall be provided within (20) working days after the approval of the Phase I submittals and prior to any fabrication or field conduit installations. All shop drawings shall be engineered in a CAD Software. Submission shall include electronic print copies to match the contract drawings, and Phase II submittals drawings shall include the following.

1.25.1 IP-Based Video Call Station elevations will be required to be provided including the position of all components on or near the Designated Doorway.

1.25.2 Provide shop drawings showing all end device locations, local and site distribution cabling, power connections and operational diagrams.

1.26 Common submittal mistakes which will result in submittals being rejected:

1.26.1 Not including the qualifications of the installing Contractor Company and Contractor's Staff.

1.26.2 Not including all items listed in the above itemized description.

1.26.3 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed (provided for the project) or crossing out the items which are not applicable.

1.26.4 Not including actual manufacturer's cut sheets or catalog information of proposed products.

1.26.5 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

1.27 The Contractor shall make a written request directly to Johnson Consulting Engineers for electronic drawing files (CAD). As a part of the written request, please include the following information:

1.27.1 Clearly indicate Project Name and Client, Johnson Consulting Job Number (located in bottom left corner of JCE Engineering Stamp) and each drawing Sheet Number required (i.e., E1.1, E2.1, E4.1 etc.).

1.27.2 Identify the name, Company, Title, phone number, mailing address and e-mail address of the person to receive the files.

1.27.3 Detail or Riser diagram sheets, System Schematic drawings or any other drawings other than floor plans or site plans, will not be made available to the Contractor.

1.27.4 Files will only be provided in the AutoCAD format in which they were created (i.e., version 2019 or later). Files will not be made available in REVIT format.

1.27.5 Requests for files will be processed as soon as possible; a minimum of 7 working days should be the normal processing time. The Contractor shall be

completely responsible for requesting the files in time for their use and delays in requesting files will not alleviate the Contractor from submitting required documents within the required timeline.

PART 2 PRODUCTS

IP-Based Video Call Station

2.1 General Description

2.1.1 Consist of an outdoor-rated vandal resistant ADA-compliant hands-free speakerphone communications device with a bonded marine-grade stainless steel faceplate, metal button, and IP camera;

2.1.1.1 Be full duplex in operation.

2.1.1.2 Be programmable from a remote location.

2.1.1.3 IP-Based Video Call Station shall be as manufactured by Aiphone Model #IX-DV(No Approved Equal).

2.1.1.4 Contractor shall provide in locations as shown in project drawings.

2.1.2 The phone faceplate shall:

2.1.2.1 Be constructed of an enhanced corrosion resistant anodized aluminum:

2.1.2.2 Measure 4.5” W x 8.07” H x 2.07” D

2.1.3 The primary button shall:

2.1.3.1 Be a high quality push button and switch in a single assembly.

2.1.3.2 Provide tactile feedback.

2.1.3.3 Have an operating temperature range of -40°F (-40°C) to +140°F (+60°C).

2.1.3.4 Have an enclosure design that is watertight as per IP54 rating.

2.1.3.5 Be constructed of an aluminum alloy, with a clear chromate finish.

2.1.3.6 Surrounded by a LED Indicator

2.1.4 The phone shall have a Low light emitting diode (LED).

2.1.5 The phone shall have a built-in microphone and speaker for two-way hands-free communications activated by call button.

2.1.6 The IP camera shall:

2.1.6.1 Be ONVIF Profile S compliant

2.1.6.2 Have a 1.23 Megapixel Fixed , 1/3” CMOS sensor

2.1.6.3 SXVGA 1280 (W) x 960 (H) active pixels

2.1.6.4 5.0 lux minimum illumination

2.1.6.5 H.264/AVC, Motion-JPEG Video CODEC

2.1.6.6 Camera vertical adjustment +15º, 0º, or -8º (manual)

2.1.7 The Surface Mount Backbox enclosure shall be integrated into the Video Call Station faceplate and shall mount directly over junction box in the wall.

2.1.8 Voice over Internet Protocol (VoIP)

2.1.8.1 The phone shall be configurable with a SIP registrar. The registrar can be configured for:

2.1.8.1.1 SIP Username

2.1.8.1.2 SIP Password

2.1.8.1.3 SIP Registrar IP Address

2.1.9 Hearing Impairment Aid (LED)

2.1.9.1 The LED shall be illuminated when the remote attendant has answered the call.

2.2 INTERFACES

2.2.1 Inputs/Outputs

2.2.1.1 The phone shall be equipped with one Normally Closed Dry Contact Auxiliary Output. The Auxiliary Output Contact shall be used to make the connection to the Electric Strike at each Entry Door where a IP-Based Video Call Station is installed. The Contact shall be used to release the Door when activated by the User from the IP-Based Video Attendant Master Station.

2.2.1.2 The Contractor shall furnish and install the manufacturer recommended cable to the Electric Strike in the Door. The connection shall be made at the Strike by the Division 8 Door Hardware Contractor. The Electric Strike Hardware will be provided with a Buzzer to provide audio notification when the Door Strike is released.

2.2.2 Network Interfaces

2.2.2.1 Each Video Call Station requires (1) Category-6 Data Cable

2.2.2.2 The phone shall be equipped with one 10/100 Base-T Ethernet ports.

2.3 POWER REQUIREMENTS

2.3.1 The phone shall be powered by one of the following power sources:

2.3.1.1 Power over Ethernet according to IEEE802.3af – Class 0.

2.4 RELAY SETTING

2.4.1 Contractor shall coordinate with the Division 8 Door Hardware Contractor for activation and release of the Electric Strike on the Entry Door where shown on the floor plans. The User in the Administrative Office shall have the ability to release the Door upon use of a code or control on the IP-Based Video Attendant Master Station to allow access for the Person at the Door. The Door shall be allowed access for a set period of time, with enough time for the person or persons to open the Door and pass through it, then for the Electric Strike to re-engage and secure the Door.

IP-Based Video Attendant Master Station

2.5 General Description

2.5.1 Aiphone Model #IX-MV7-HB is an IP addressable hands-free or handset master station with a 7" color touchscreen. It can be wall or desk mounted (desk stand included)

2.6 Specifications

2.6.1 SIP 2.0 Compliant allowing integration with Cisco Unified Call Manager®.

2.6.2 ONVIF® Profile S Compliant

2.6.3 802.3af PoE, Class 0

2.6.4 7″ TFT LCD touchscreen

2.6.5 Use built-in cameras for two-way master-to-master video conferencing (w/ privacy shutter)

2.6.6 Hands-free or push-to-talk communication

2.6.7 8 customizable speed dial buttons

2.6.8 Capture and store the audio and video of active conversations on a microSD™ card. Contractor shall furnish and install 128GB microSD Card

2.6.9 Picture-in-Picture (PIP) allows an ONVIF Profile S IP camera and an Aiphone video intercom to be viewed simultaneously

2.6.10 2 contact outputs, 4 trigger inputs

2.6.11 8Ω 1/2 watt speaker output provides better coverage for announcements

2.6.12 600Ω audio input.

2.6.13 2-year warranty!”

2.6.14 Video Attendant Station creates a seamless integration between IP Call Stations and the Attendant station. Multiple call stations can be connected to master station.

2.6.15 Contractor shall program the Master Station for activation and release of the Electric Strike on each of the Entry Doors shown on the floor plans. The User in the Administrative Office shall have the ability to release each Door individually upon use of an individual code or control for each Door on the IP-Based Video Attendant Master Station to allow access. The Video Call Station Dry Contact shall release the Door for a set period of time programmed into the Master Station Control. The code or control shall provide release of the Auxiliary Dry Contact for a minimum of 10 seconds, with enough time for the person or persons to open the Door and pass through it, then for the Electric Strike to re-engage and secure the Door after the Person or Persons have passed through.

2.6.15.1 Adjust the time based on trial and error and input from the School Administration. Contractor shall provide 2-Man Hours for Service to provide adjustments to the Door Operations and Control and Programming changes as required by the School for improved operation. Time does not include travel time to the School or additional parts. Travel Time and additional parts to the Door Release function shall be included as part of the Contractor's bid.

2.6.16 Display & Graphics:

2.6.16.1 Display Screen Type: 7" Touch Screen TFT LCD Display

2.6.16.2 Touchscreen: Yes

2.6.17 Input Voltage: POE+ IEEE802.3af

2.6.18 Additional Interfaces; 3.5mm Stereo Mini Jack

2.6.19 Network Interface; 10/100/1000 Mbps Port w/integrated POE

2.6.20 Two-Year Limited Warranty

Cable Requirements

2.7 The 27 10 00 Contractor shall provide Category-6 UTP cables from the nearest MDF or IDF closet/cabinet to the new IP-Based Video Call Station or IP-Based Video Attendant Master Station location. All IP-Based Video Call Stations shall be by POE (Power-Over-Ethernet). Coordinate with 27 10 00 Contractor for locations of data outlets.

2.8 All cables installed in underground conduit shall be outdoor rated for wet location installations. Provide cabling to the locations shown on the floor plans. All of the locations will require a junction box at the location for the cable termination. Refer to the floor plans for locations that require conduit by the Division 26 Contractor.

2.9 Each Video Call Station shall be provided with (1) Category-6 UTP Data cable/port. Connect to the Vido Call Station per manufacturer's instructions.

2.9.1 Each IP-Based Video Call Station location shall be provided with (1) Category-6 UTP cable, from the MDF or IDF closet/cabinet location. The Contractor shall

terminate the data cable at the Call Station as shown in the Detail Drawings. Cable shall be terminated inside the Call Station's Backbox unless otherwise noted.

2.9.2 Each IP-Based Video Attendant Master Station location at each School shall be provided with (1) Category-6 UTP cable, from the MDF or IDF closet/cabinet location.

Copper Patch Cords

2.10 Copper patch cords shall be furnished and installed by the 27 10 00 Contractor. Coordinate lengths of patch cables required with the 27 10 00 Contractor.

2.11 Category-6 patch cables installed at the MDF/IDF location (patch panel end) shall match the color of the outlet inserts on the patch panel and faceplate. The patch cables will be provided in 4-foot length for standard installations.

2.12 Category-6 patch cables installed at the Master Attendant (outlet) location shall match the color of the outlet inserts on the faceplate. The patch cables will be provided in 12-foot length for standard installations.

2.13 Category-6 patch cables installed at the IP-Based Video Call Station locations shall (1) feet in length, color as required. The patch cables will be provided for installation within the Call Station Backbox.

PART 3 EXECUTION

3.1 All loudspeaker circuits and communication circuits shall operate balanced to ground.

3.2 Circuits shall be grounded as recommended by manufacturer or equipment to which they are connected unless otherwise specified.

3.3 All wiring shall test free of grounds and shorts.

3.4 All wiring for the complete system shall be new wire. Any wires pulled through in underground junction boxes shall be continuous with no splices in these boxes. The wiring shall be intact without cuts in the protective outer jacket.

3.5 All data cabling will be provided and installed by the 27 10 00 Contractor. Ethernet switches in the MDF/IDF locations shall be furnished and installed by the District IT Department. Connect the VOIP communications device to the Ethernet switch on a POE Port. Coordinate installation with the 26 00 00 Contractor.

3.6 All materials shall be delivered to the site in unbroken packages. Packages shall be inspected and approved by the District Inspector before opening.

3.7 Contractor shall submit shop drawings to the Project Engineer.

General Performance Requirements

3.8 Reproduction of speech shall be clear, high fidelity, and with all frequencies within range of system faithfully reproduced with no detectable noise, hum, or distortion.

3.9 Audio level of telephone intercommunication system shall be attained at sound levels sufficient to override noise levels typical for schools and traffic areas, to provide a

thoroughly satisfactory and serviceable system. The Contractor shall adjust the speaker levels at all locations to provide optimal sound pressure levels and clarity.

Inspection and Test upon Completion

3.10 Check out and final connections to the system shall be made by a factory-trained technician in the employ of a Contractor. In addition, factory-trained technicians shall demonstrate operation of the complete system and each major component to the District.

3.11 All materials and installation shall be guaranteed to be free of defects in material and workmanship for two years after final acceptance of installation and test.

3.12 Upon completion of the installation, four (4) copies of complete operational instructions shall be furnished, complete with record drawings. Instructions shall include part numbers and names, addresses, and telephone numbers of parts source. Final payment shall not be made until operational and maintenance manuals have been received.

3.13 Upon completion of the installation of the equipment, Contractor shall provide to the District a signed statement from the equipment manufacturer that the system has been tested and functions properly according to the specifications.

Operation and Training

3.14 Contractor will provide a minimum of 4 clock hours of on-site training for site Technical and Administrative Staff on the IP-Based Video Call Station Systems. Training for personnel shall be provided by certified technology specialists. The scope of training shall encompass system operation and procedures. Technician training should include an integrated information overview, media retrieval procedures as well as operation procedures for local control configurations. The Contractor shall provide a detailed written outline clearly describing the proposed plan for all training, for approval by the Engineer and Owner's representative. Contractor shall submit at training schedule to the District to coordinate which District Technical staff shall be trained.

3.15 Warranty service calls made by telephone to this Contractor or his designated representative shall hereby be defined as proper notification that warranty service is required.

PART 4 RECORD DRAWINGS

4.1 The contractor shall maintain record drawings as specified in accordance with these specifications, and as noted below.

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

4.3 Final As-Built Drawing Submittals - Provide (1) hard bound copy of "E-size" As-Built drawings and (3) copies on USB Flash Drive in AutoCAD (2019 or newer version) format. A Hand marked-up copy of the original construction drawings will not be accepted as the final As-Built drawing submittal. Final As-Builts shall include copies of the floor plan and site plan drawings, detailed elevations of IP-Based Video Call Station System equipment installations, quantities of locations, locations of all System Devices, and identification of all final cable routes.

END OF SECTION

OFFICE IMPROVEMENTS
Descanso Elementary School

SECTION 283000

FIRE ALARM SYSTEM

PART 1 GENERAL

1.1 Work Included:

1.1.1 Furnish and install all equipment, accessories, and materials in accordance with these specifications and drawings to provide a complete and operating fire alarm system.

1.2 Related Work:

1.2.1 Division 26 01 00: Electrical General Provisions
1.2.2 Division 26 05 33: Conduit and Fittings
1.2.3 Division 26 05 34: Outlet and Junction Boxes

1.3 The equipment and installation shall comply with the current applicable provisions of the following standards:

NFPA 72-2022. . . . . National Fire Alarm Code with California Amendments.
CBC - 2022. . . . . California Building Code (CBC), Part 2, Title 24, CCR.
CEC - 2022. . . . . California Electrical Code, (CEC), Part 3, Title 24, CCR.
CFC - 2022. . . . . California Fire Code (CFC), Part 9, Title 24, CCR.

1.4 The system and all components shall be listed by Underwriters Laboratories, Inc. for use in Fire Protective Signaling Systems under the following standards as applicable:

UL 38 . . . . . Manually Actuated Signaling Boxes.
UL 50 . . . . . Cabinets and Boxes.
UL 268 . . . . . Smoke Detectors for Fire Protective Signaling Systems.
UL 268A . . . . . Smoke Detectors for Duct Applications
UL 346 . . . . . Waterflow Indicators for Fire Protective Signaling Systems.
UL 464 . . . . . Audible Signaling Appliances.
UL 521. . . . . Heat Detectors for Fire Protective Signaling Systems.
UL 864 . . . . . Control Units for Fire Protective Signaling Systems.
UL 1481. . . . . Power supplies for Fire Protective Signaling Systems.
UL 1971. . . . . Visual Signaling Appliances.

1.5 Only Fire Alarm Control Panel Equipment and Peripheral Field Devices have been shown on the Contract Bid Single Line Block Diagram. Specific and complete wiring between Control Equipment and Peripheral Equipment has been deleted for clarity.

1.6 Submittal shall be made **in accordance with Division 26 01 00 – Shop Drawings and Submittals.** This submittal shall include the following:

1.6.1 Complete bills of quantities, including all materials, components, devices, wiring and equipment required for this work. The bills of quantities shall be tabulated respective of each and every system as specified, and shall contain the following information for each item listed:

1.6.1.1 Quantity of each type of equipment item.
1.6.1.2 Quantities of 10% spare devices as per 1.16.
1.6.1.3 Description of each item.
1.6.1.4 Manufacturer's Name and Model Number.

1.6.1.5 Manufacturer's Specification Sheet.
1.6.1.6 Back box type and dimensions per device type.
1.6.1.7 California State Fire Marshall Listing Sheets for all components.
1.6.1.8 Equipment items which have individual components, will require that all component parts be listed individually.
1.6.1.9 Letter indicating the contractor's intent to comply with Phase II submittal drawings.

1.7 Phase II Submittal shall be provided **within (20) working days** after the approval of the Phase I submittals and prior to any fabrication or field conduit installations. All shop drawings shall be engineered and drawn on a CAD System. Each submission shall include 'D' or 'E' size print copies to match the contract drawings, and one (1) data disk copy with files in an AutoCAD 2000i or 2004 format. Building floor plan CAD files on disk, will be made available via express mail after the receipt of payment of $50.00 per building floor plan, or $300.00 minimum which ever is less. Contractor shall make the request for drawings in writing directly to Johnson Consulting Engineers, confirmation of the request and a release form will be forwarded to the contractor to include a signed copy with payment prior to release of files. Detail or riser diagram sheets or any other drawings other than floor or site plans, will not be made available to the contractor.

1.7.1 **Provide complete shop drawings to include the following:**

1.7.1.1 Complete floor plans, at scale of contract documents, showing the locations throughout the project of all devices, panels conduits, wireways, tray, pullboxes, junction boxes, number and type of conductors, and other devices.

1.7.1.2 Point to point wiring diagrams showing wiring from panel terminals to each device.

1.7.1.3 Riser diagram indicating all wiring and circuits.

1.7.1.4 Current State Fire Marshal listing sheets for all components and devices.

1.7.1.5 Provide battery power supply calculations, indicate point of power supply connection, means of disconnect, over-current protection, etc. for each panel.

1.7.1.6 Provide detailed information on conductors to be used-manufacturer, type, size, insulation, etc.

1.7.1.7 Provide voltage drop calculations for all conductor run is from each panel (i.e., main FACP, remotes, power extenders, etc.) for each panel.

1.7.1.8 Provide written sequence of system operation matrix.

1.7.1.9 Provide list of zones. (Every device that is addressable.)

1.7.1.10 Provide detailed drawing for annunciator panel indicating all zones and initiating devices.

1.8 **Common submittal mistakes which will result in submittals being rejected:**

1.8.1 Not including the qualifications of the installing contractor.

1.8.2 Not including all items listed in the above itemized description.

1.8.3 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.

1.8.4 Not including actual manufacturer's catalog information of proposed products.

1.8.5 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

1.9 All equipment and material shall be new and unused, and listed by Underwriter's Laboratories for the specific intended purpose. All control panel components and field peripherals shall be designed for continuous duty without degradation of function or performance. All equipment covered by this specification or noted on Installation. Drawings shall be equipment suited for the application and shall be provided by a single manufacturer or be recognized and UL listed as compatible by both manufacturers.

1.10 It will be the responsibility of the Contractor to ensure proper specification adherence for system operation, final connection, test, turnover, warranty compliance, and after-market service. The distributor of the equipment specified must be factory-trained and certified.

1.11 Basic System Functional Operation, upon operation of any automatic, manual or other initiation device the following shall occur:

1.11.1 The system alarm LED shall flash.

1.11.2 A local piezo electric signal in the control panel shall sound.

1.11.3 A backlit 80-character LCD display shall indicate all information associated with the fire alarm condition, including the alarm point and its location within the protected premises.

1.11.4 History storage equipment shall log the information associated with each new fire alarm control panel condition, along with time and date of occurrence.

1.11.5 All system output programs assigned via control by event equations to be activated by the particular point in alarm shall be executed, and the associated system outputs (alarm notification appliances and/or relays) shall be activated.

1.11.6 LED display and audible signaling at the remote annunciator indicating building, fire zone, and type of device. Annunciator shall also provide a separate audible signal for CO detection with a green flashing light, with classroom number indication.

1.11.7 Automatic retransmission to a UL central station for fire department notification.

1.11.8 Automatic shut down of air conditioning units shall be performed by control modules at each unit when required as part of a complete area coverage design

scheme. Each building shall shut down all A/C units and dampers within that building as one zone.

1.12 All equipment and components shall be new, and the manufacturer's current model. The materials, appliances, equipment and devices shall be tested and listed by a nationally recognized approval agency for use as part of a protective signaling system.

1.13 All equipment and components shall be installed in strict compliance with manufacturer's recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation.

1.14 All equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place. Fasteners and supports shall be adequate to support the required load.

1.15 All wiring shall be installed in a conduit system.

1.16 The contractor shall provide as a part of this contract additional control modules, heat detectors, smoke detectors, duct detectors, manual pull stations, strobes, horn/strobes devices etc. along with all required programming, to equal 10% of the total quantity of devices shown on the drawings, or a minimum of three (3) for each type, whichever is greater. Installation of 50’ of conduit, boxes and all wiring for each of the devices shall be included, and required locations coordinated with CSFM final approved shop drawings. Any devices not required to be included during construction shall be delivered to the District at the completion of the project. The quantities of these devices shall be listed as a part of the Phase I submittals.

1.17 The installing contractor shall provide a copy of current documentation, indicating that the contractor installing the fire alarm systems or devices and wiring, is certified by Underwriters Laboratories (UL) in its product directories under the listing category "PROTECTIVE SIGNALING SERVICES - LOCAL, AUXILIARY, REMOTE STATION, AND PROPRIETARY.” The contractor shall be certified by the manufacturer to install and program the system. The contractor must also provide complete installation of all wiring and equipment, and software programming. Supervised installation of the wiring, devices and/or any software programming shall not be permitted.

1.17.1 The installing contractor must also be an “authorized dealer” by the equipment manufacturer, and must have completed all required training prior to the bid of this project.

1.17.2 The fire alarm system installation shall be warranted by the manufacturer’s representative.

1.17.3 The Contractor shall have a current California C-10 or C-7 Contractor’s License, and all individuals working on this project shall have passed the Department of Industrial Relations Division of Apprenticeship Standards – “Fire / Life Safety Certification Program.”

1.17.4 The installing contractor shall provide, at the time of submittal, a letter of intent to provide an extended service warranty. This warranty shall extend for a total of three (3) years, starting at the completion, testing, and training of this project. The service warranty shall cover all material and labor to keep operational all system devices installed under this project and shall include two (2) complete U.L. system’s tests and cleaning of all devices at year two (2) and year three (3)

of the warranty. Routine cleaning of devices, other than at the two (2) specified U.L. system's testing periods, will not be included as a part of this warranty.

1.17.5 The installing contractor shall provide, at the time of submittal, a letter indicating that the installation crew for this project meets the following NICET certifications:

1.17.5.1 25% of the installing field personnel must have completed NICET Level 2 Certification.

1.17.5.2 One of the installing field personnel and /or supervisor must have completed NICET Level 3 Certification.

1.17.5.3 Contractor shop drawings shall be signed by an individual who has completed NICET Level 4 Certification.

1.18 All conduit and standard backboxes will be furnished and installed by the Division 26 Contractor. Specialty boxes will be furnished by the equipment supplier to be installed by the Division 26 Contractor.

1.19 Equipment and materials shall be the standard product of **FCI.**

1.20 Alternate equipment as manufactured by any other manufacturer not specifically listed above will not be approved for use on this project.

1.21 D.S.A approved drawings are included as a part of the drawing set.

PART 2 PRODUCTS

2.1 Main Fire Alarm Control Panel:

2.1.1 Fire alarm control panel is EXISTING FCI 7100.

2.1.2 The system shall be controlled and supervised by a microprocessor based monitoring fire alarm control panel. The systems shall be addressable, field configurable, programmable and editable. The system shall continuously scan devices for change of status. Each device shall have its own unique address, but shall also be grouped by building as a separate zone for remote annunciation and alarm report purposes.

2.1.3 The fire alarm control panel shall be housed in a lockable, code gauge steel cabinet with 80character LCD display, master controller operators panel, indicating lamps, silence switch and reset switch mounted on cabinet front. The fire alarm control panel shall be physically and visually located in the general office for monitoring by staff, and shall sound the "Voice Message" in all zones. Signal duration shall be field programmable and initially set at three minutes. Provide all control modules, synchronous modules, etc., to provide a complete working system per all codes that apply.

2.1.4 The fire alarm control panel shall come with standardized software for on-site customization of the system. The unit shall be capable of providing a 600-event historical log with zone or point selectable alarm verification.

2.1.5 The unit shall support a minimum of 3000 intelligent addressable points and one output point, SPST contact per zone. Provide the number of modules necessary

to control and supervise fire alarm devices as shown on the Drawings, as well as to provide 25% spare capacity.

2.1.6 The unit shall also provide a minimum of (2) class B strobe circuits with additional circuits as indicated on the drawings.

2.1.7 The fire alarm control panel shall be capable of providing a walk test.

2.2 The power feed for the FACP shall be 3-wire, 120volt, AC, single phase (20A circuit) permanently labeled “FIRE ALARM CONTROL POWER”, terminating at the master fire alarm control and supervisory panel. The label shall be red with 1/4” high white lettering. The source circuit breaker must be provided with a lock-on device.

2.3 In addition to the AC circuit, the panel shall be equipped with a DC battery to activate an audible alarm and pilot light in case of a power failure on the AC circuit.

2.4 The master fire alarm panel shall be equipped with a manual pull lever type, supervised report station.

2.5 With the exception of the manually operated report station required at the master fire alarm panel and large assembly areas, the remainder of the school facility shall be equipped with approved, electronically supervised, automatic fire detection devices, such that every room, space, including concealed spaces, such as the attic spaces above ceilings, etc., is provided with approved coverage.

2.6 REMOTE POWER SUPPLIES shall provide a minimum of (4) Class B NAC circuits.

2.7 HORN / STROBE DEVICE shall be of the semi-flush type designed for mounting to a standard four-inch square electrical outlet box. Each device shall be provided with a semi-flush accessory plate. Exterior horns shall be weatherproof. The strobe unit shall have a meantime between failure (MTBF) of 1,000 hours or greater. The strobe section shall have a minimum flash rate of approximately one flash per second, with candela rating as per UL standard 1971. Housing shall be white.

2.7.1 In areas containing two or more audible devices, or three or more visual devices, these devices shall be synchronized, Per NFPA 72, Chapter 18 California Amendments (2022).

2.8 STROBES. The strobe unit shall have a meantime between failure (MTBF) of 1,000 hours or greater. The strobe section shall have a minimum flash rate of approximately one flash per second, with candela rating as per UL standard 1971. Housing shall be white.

2.8.1 In areas containing two or more audible devices, or three or more visual devices, these devices shall be synchronized, per NFPA 72, Chapter 18 California Amendments (2016).

2.8.2 Maximum pulse duration to be 0.20 of a second with an ADAAG 4.28.3(3). Visual alarms maximum duty cycle of 40%.

2.8.3 Capable of providing minimum candela. Intensity as shown on plans (effective strength measured at the source).

2.8.4 The flash rate to be a minimum of 1 Hz and a maximum of 2 Hz per NFPA 18.5.3.1.

2.9 HEAT DETECTOR DEVICES shall be analog addressable, fixed temperature x rate of rise, fixed at 200°F and a 15°F/min rate of rise. In janitor rooms equipped with kilns, devices shall be fixed at 200°F.

2.10 SMOKE DETECTOR DEVICES shall be analog addressable, photo-electric.

2.11 REMOTE ANNUNCIATOR shall be an 80 character backlit, alphanumeric, LCD readout display. The display shall include alarm, supervisory, CO detection and trouble condition LEDs and tone alert. Each condition shall have a dedicated acknowledge push button switch to silence the local tone alert but leaves the LED lights on until all conditions have been restored.

2.12 DIGITAL ALARM COMMUNICATOR TRANSMITTER. The control panel shall meet the requirements of UL 864 for central station connections, and shall be UL listed for use with the fire alarm control panel. The communicator shall be connected to supervise two telephone lines, all wiring required for this connection shall be provided by the fire alarm contractor Coordinate interface with District monitoring company as required.

PART 3 EXECUTION

3.1 All wiring shall be (min) #18 AWG copper or as noted on drawings. All underground conductors shall be UL wet location rated for use in wet locations, West Penn “Aquaseal” or equal. There shall be no splices in underground handholes or vaults. A multi-conductor cable rated for use in wet locations will also be acceptable. It must be labeled “FIRE ALARM” in all pull boxes, using a water-tight labeling system.

3.2 Interior, dry location wiring for low voltage initiating circuits shall be #18 AWG copper, twisted shielded pair minimum, signaling circuits shall be No. 14 AWG minimum, and wiring for 120 volt circuits shall be No. 12 AWG minimum. All wiring shall be color coded, solid copper conductor. Use of power limited cable shall be restricted to controls listed for this purpose. Single conductors shall be type THHN/THWN-2 insulated copper.

3.3 Wire markers shall be provided for each wire connected to equipment. The marker shall be of the taped bank type, of permanent material, and shall be suitable and permanently stamped with the proper identification. The markers shall be attached in a manner that will not permit accidental detachment. Changing of wire colors within circuits shall be unacceptable.

3.4 A terminal cabinet shall be installed in the electric room for the fire alarm systems at each building. All fire alarm wiring shall terminate on UL approved strips in this terminal cabinet. All wiring shall be labeled at each termination strip. Wiring shall be configured such that all end-of-line resistors will be installed at the terminal cabinet.

3.5 Fire Sprinkler Activation detecting System(s) shall each be indicated on a separate zone in the fire alarm control panel.

3.6 Fire Alarm Control Panel and all other equipment shall be mounted with the center of all operable reset buttons, located a maximum of 48" front approach / 54" side approach above floor level.

3.7 Contractor shall provide complete wiring between all equipment.

3.8 The Fire Alarm/Life Safety Installation shall comply fully with all Local, State and National Codes, and the Local Authority Having Jurisdiction (AHJ) DSA.

3.9 The Fire Alarm Control Panel and power supply shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the Panelboard as FIRE ALARM CIRCUIT.

3.10 The Control Panel Cabinet shall be grounded securely to a power system ground conductor. Provide a 1/2-inch conduit and 1#12 grounding conductor to the building electrical service ground bus.

3.11 Conduit shall enter into the Fire Alarm Control Panel back box only at those areas of the back box which have factory conduit knockouts.

3.12 All field wiring shall be completely supervised. In the event of a primary power failure, disconnected standby battery, removal of any internal modules, or any open circuits in the field wiring; an audible and visual trouble signal will be activated until the system and its associated field wiring are restored to normal condition.

3.13 All cables and wiring shall be listed for Fire Alarm/Life Safety use, and shall be of the type as required by and installed per CEC Article 760.

3.14 Final System Acceptance

3.14.1 Provide an NFPA Certificate of Compliance to DSA and the engineer of record. Complete fire alarm system shall comply with Chapter 14 of NFPA for testing and inspection and be sound-tested for audibility in all spaces requiring voice evacuation. This testing shall be performed in the presents of the project electrical engineer.

3.14.2 Beam detectors shall be tested by two methods:

3.14.2.1 Manual slow cover test to confirm reflector alignment is correct.

3.14.2.2 Software fire test per UL268.5 to demonstrate when signal level is reduced simulating obstruction the detector will go into alarm.

3.14.3 The system will be accepted only after a satisfactory test of the entire system has been accomplished by a Factory-Trained Distributor in the presence of a representative of the authority having jurisdiction and the Owner's representative. This contractor shall provide all personnel, ladders and testing equipment to assist the local authority in completing this test. Actuate each device and verify that the system performs as specified.

3.14.4 The Contractor will present a complete set of "as-built" Fire Alarm/Life Safety system drawings, and the factory supplied Operator's Manuals as required by the General Provisions section of this specification.

3.14.5 Once the system has been tested and the certificate of compliance completed, the contract shall not be considered complete until after owner training has been completed. The contractor shall notify in writing their intent to provide the training for the system. This notification shall be given to the Division 21 Contractor, Architect and the Project Engineer a minimum of 2 weeks prior to the scheduled training session. The Division 21 Contractor and/or the architect shall be responsible for notifying the owner to confirm that the appropriate District personnel will be made available for this training session. If the Division 21 Contractor does not receive confirmation that the training session can be

performed on the proposed date, then another time shall be provided. The training shall consist of the following:

3.14.5.1 Provide a minimum of one (1) four-to-six -hour training period located at the project site, to instruct District personnel in proper operation of all systems.

3.14.5.2 Provide a minimum of three (3) complete owner operation manuals for the District records.

3.14.5.3 Provide a minimum of two (2) complete as built sets of drawings for the District records.

3.14.5.4 Provide all spare parts as described in part 1 of these specifications

3.14.5.5 Provide written confirmation and proposed scheduled dates for follow up training and 1-year complete system test.

3.15 Follow up Training

3.15.1 Provide as a part of this contract, the follow up instructional training period within six (6) months after the final acceptance of the systems. This training shall include a minimum of one four-to-six-hour training period to instruct District personnel in proper operation of all systems and shall instruct the District technicians how to repair any non-operational parts of the system as required. All defective parts shall be replaced at no cost to the owner.

END OF SECTION

SECTION 32 1313
CONCRETE PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete ramps and walk paving.

1.02 REFERENCE STANDARDS

A. 2022 California Building Code, Chapter 11-B and 19A.

B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete 1991 (Reapproved 2009).

C. ACI 301 - Specifications for Structural Concrete 2010 (Errata 2012).

D. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete 2000.

E. ACI 305R - Hot Weather Concreting 2010.

F. ACI 306R - Cold Weather Concreting 2010.

G. ASTM A185/A185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2007.

H. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement 2015.

I. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete 2015.

J. ASTM C33/C33M - Standard Specification for Concrete Aggregates 2013.

K. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens 2015a.

L. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete 2015.

M. ASTM C150/C150M - Standard Specification for Portland Cement 2015.

N. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete 2011.

O. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete 2015.

P. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types) 2004 (Reapproved 2013).

Q. ASTM D1752 - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction 2004a (Reapproved 2013).

1.03 SUBMITTALS

A. See Section 01 3010 - Submittals, for submittal procedures.

B. Design Data: Indicate pavement thickness, designed concrete strength, reinforcement, and typical details.

1.04 QUALITY ASSURANCE

A. Perform work in accordance with ACI 301.

B. Obtain cementitious materials from same source throughout.

C. Follow recommendations of ACI 305R when concreting during hot weather.

D. Follow recommendations of ACI 306R when concreting during cold weather.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 PRODUCTS

2.01 PAVING ASSEMBLIES

A. Concrete Walks and Paving: 3,500 psi 28 day concrete, 4 inches thick minimum, unless noted otherwise on the drawings.

2.02 FORM MATERIALS

A. Wood form material, profiled to suit conditions.

B. Joint Filler: Preformed; non-extruding bituminous type (ASTM D1751) or sponge rubber or cork (ASTM D1752).
   1. Thickness: 1/2 inch.

2.03 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi) yield strength; deformed billet steel bars; unfinished.

B. Steel Welded Wire Reinforcement: Plain type, ASTM A1064/A1064M; in flat sheets; unfinished.

C. Dowels: ASTM A615/A615M, Grade 40 - 40,000 psi yield strength; deformed billet steel bars; unfinished finish.

2.04 CONCRETE MATERIALS

A. Obtain cementitious materials from same source throughout.

B. Cement: ASTM C150/C150M Type II portland type, grey color.

C. Fine and Coarse Mix Aggregates: ASTM C33/C33M.

D. Fly Ash: ASTM C618, Class C or F.

E. Water: Clean, and not detrimental to concrete.

2.05 ACCESSORIES

A. Curing Compound: ASTM C 309, Type 1, Class A.

B. Joint Sealer: Type as specified in Section 07900.

C. Color Additives.
   1. Concrete colors shall be as noted on the drawings.
   2. Colored additives containing carbon black are not allowed.
   3. Liquid Integral Color Admixture
      a. "Chromix" Liquid Color - L.M. Scofield Comapny, (800) 800-9900, www.scofield.com.
      b. "Hydrotint" Liquid Color - Davis Colors, Inc., (800) 356-4848, www.daviscolors.com.
      c. "Colorflo" Liquid Color - Solomon Colors (866) 747-2556.

2.06 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.

B. Proportioning Normal Weight Concrete: Comply with the 2022 California Building Code, Chapter 19A.

C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.

D. Concrete Properties:
   1. Compressive strength, when tested in accordance with ASTM C39/C39M at 28 days; 3,500 psi. or as otherwise noted on the drawings and details.
   2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
   3. Minimum cement content per cubic yard: 6.5 sacks.

4. Maximum water-cement ratio per 94-pound sack of cement (gallons): 6.75.
5. Total Air Content: 4 percent, determined in accordance with ASTM C173/C173M.
6. Maximum Slump: 3 inches.
7. Maximum Aggregate Size: 1 inch.

2.07 MIXING

A. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.

B. Verify gradients and elevations of base are correct.

3.02 SUBBASE

A. Prepare subbase in accordance with State of California Public Works standards.

3.03 PREPARATION

A. Moisten base to minimize absorption of water from fresh concrete.

3.04 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.

3.05 REINFORCEMENT

A. Place reinforcement at midheight of slabs-on-grade.

B. Interrupt reinforcement at contraction joints.

C. Place dowels to achieve pavement and curb alignment as detailed.

D. Size and Spacing: Reinforcement for site walks and pavement shall be No. 3 bars at 18 inches on center each way.

3.06 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.

C. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

D. Apply surface retarder to all exposed surfaces in accordance with manufacturer's instructions.

3.07 JOINTS

A. Align curb, gutter, and sidewalk joints.

B. Place 3/8 inch wide expansion joints at 20 foot intervals and to separate paving from vertical surfaces and other components and in pattern indicated.
   1. Form joints with joint filler extending from bottom of pavement to within 1/2 inch of finished surface.
   2. Secure to resist movement by wet concrete.

C. Provide scored joints.
   1. At 5 feet intervals, or as indicated on the drawings.
   2. Between sidewalks and curbs.
   3. Between curbs and pavement.

3.08 FINISHING

A. Sidewalk Paving: (Surfaces less than 6% slope): medium broom, texture perpendicular to direction of travel with troweled and radiused edge 1/4 inch radius.

B. Sidewalk / Ramp Paving: (Surfaces greater than 6% slope): heavy broom, texture perpendicular to direction of travel with troweled and radiused edge 1/4 inch radius.

C. Curbs: Light broom, texture parallel to pavement direction.

D. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

E. Portland cement concrete paving shall be stable, firm, and slip resistant and shall comply with CBC Sections 11B-302 and 11B-403.

3.09 JOINT SEALING

A. See Section 07 9005 for joint sealer requirements.

3.10 TOLERANCES

A. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.

B. Maximum Variation From True Position: 1/4 inch.

3.11 CONCRETE CURING

A. Comply with requirements of ACI 308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Moist cure and maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
   1. Normal concrete: Not less than 5 days.

C. Surfaces Not in Contact with Forms:
   1. Start initial curing as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
   2. Begin final curing after initial curing but before surface is dry.
      a. Curing compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

3.12 PROTECTION

A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

B. Do not permit pedestrian traffic over pavement for 7 days minimum after finishing.

END OF SECTION