SECTION 01 74 00

CLEANING AND WASTE MANAGEMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Cleaning throughout the construction period, and final project cleaning after acceptance tour "**Punch List**" has been completed.

B. Related Work Described Elsewhere: In addition to standards specified herein, comply with requirements for cleaning as described in other sections of these Specifications.

1.02 QUALITY ASSURANCE

A. Inspection: Conduct daily inspection, and more often if necessary, to verify that requirements of cleanliness are being met.

B. Codes and Standards: In addition to the requirements specified herein, comply with pertinent requirements of authorities 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 cleaning materials and equipment which are compatible with the surfaces being cleaned, as recommended by the manufacturer of the material to be cleaned.

B. Do not power wash concrete/masonry surfaces.

PART 3 - EXECUTION

3.01 PROGRESS CLEANING

A. General:

1. Retain stored items in an orderly arrangement allowing maximum access, not impeding drainage or traffic, and providing the required protection of materials.

2. Do not allow the accumulation of scrap, debris, waste material, and other items not required for construction of this work. Debris shall be removed from the site and disposed of in a lawful manner. Disposal receipts or dump tickets shall be furnished to Architect upon request.

3. At least twice each month, and more often if necessary, remove scrap, debris, and waste material from the job site.

4. Provide adequate storage for 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 items to the place designated for their storage. Combustible waste shall be removed from the site. Flammable waste shall be kept in sealed metal containers until removed from the site.

2. Weekly, and more often if necessary, inspect, arrangements of materials stored on the site; restack, tidy, or otherwise service arrangements to meet the requirements specified above.

3. Maintain the site in a neat and orderly condition.

C. Structures:

1. Weekly, and more often if necessary, inspect the structures and pick up scrap, debris, and waste material. Remove items to the place designated for their storage.

2. Weekly, and more often if necessary, sweep interior spaces clean.

a. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and a handheld broom, i.e., "broom-clean".

3. As required preparatory to installation of succeeding materials, clean the structures of pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using equipment and materials required to achieve the required cleanliness.

4. Following the installation of finish floor materials, clean the finish floor daily and more often if necessary, and while work is being performed in the space in which finish materials have been installed.

a. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from foreign material which, in the opinion of the Architect, may be injurious to the finish floor material, i.e., "vacuum clean".

3.02 FINAL CLEANING

A. Definition: Except as otherwise specifically provided, "clean", for the purpose of the Article, shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials, i.e., "scrub and polish clean".

B. General: 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 above.

C. Site: Unless otherwise specifically directed by the Architect, water and broom clean paved areas on the site and public paved areas directly adjacent to the site. Remove resultant debris.

D. Structures:

1. Exterior: In areas affected by the work under this contract, visually inspect exterior surfaces and remove traces of soil, waste material, smudges, and other foreign matter. Remove traces of splashed material from adjacent surfaces. If

necessary to achieve a uniform degree of exterior cleanliness, hose down the exterior of the structure.

In the event of stubborn stains not removable with water, the Architect may require light sandblasting or other cleaning at no additional cost to the Owner.

2. Interior: In areas affected by the work under this contract, visually inspect interior surfaces and remove traces of soil waste material, smudges, and other foreign matter. Remove traces of splashed materials from adjacent surfaces. Remove paint drippings, spots, stains, and dirt from finished surfaces. Use only the cleaning materials and equipment instructed by the manufacturer of the surface material.

3. Glass: Clean glass inside and outside.

4. Polished surfaces: On surfaces requiring the routine application of buffed polish, apply the polish recommended by the manufacturer of the material being polished. Glossy surfaces shall be cleaned and shined as intended by the manufacturer.

E. Timing: Schedule final cleaning after the **Final Punch List** has been completed by the Architect to enable the Owner to accept a completely clean project.

3.03 CLEANING DURING OWNER'S OCCUPANCY

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

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Operations and submittals required to establish Substantial Completions, Project Acceptance, and filing of Notice of Completion.

B. Contract Completion Date is the day established by the Agreement, the Special Conditions, and the Notice to Proceed as the calendar date by which all Work must be completed in accordance with the Contract Documents. Once established, the Contract Completion Date can only be altered by Change Order. If Work is not complete in accordance with the Contract Documents by the Contract Completion Date, Contractor is obligated to pay liquidated damages to the Owner. In accordance with the terms of the Contract.

C. Substantial Completion: The Date of Substantial Completion is the date on which the Architect certifies to the Owner that construction is sufficiently complete, in accordance with the Contract Documents, that the District may occupy the Project for the use intended, and all agencies and authorities have provided written acceptance of the portions of the Work over which they have jurisdiction.

D. Project Acceptance: The District will accept completion of the Contract after the entire Work shall have been completed to the satisfaction of the District and after issuance of the Certificate of Substantial Completion. The Work may only be accepted as complete by formal action of the Governing Board of the School District. Acceptance of the Project by the Governing Board establishes the formal and official Completion Date for the Project, to be compared against the Contract Completion Date. Project Acceptance must occur prior to Contract Completion Date to preclude assessment of liquidated damages.

E. Notice of Completion: The date of record for the Notice of Completion shall be the date stamped on the Notice by the County Recorder at the time the County Recorder registers the Notice (note: this is normally not the same date as the date the Owner actually files the Notice of Completion with the Recorder office).

1.02 CLOSEOUT SCHEDULE AND PROCEDURE

A. Requirements Preparatory to Project Acceptance:

1. Contractor shall deliver certifications to Architect that no new materials containing asbestos have been included in the work.

2. Temporary facilities shall be removed from site as specified in Section 01 50 00, Temporary Facilities and Controls.

3. Entire site shall be thoroughly cleaned of all construction debris.

4. Record drawings shall be completed, signed by Contractor and Inspector and submitted to Architect as specified in Section 01 78 39 – Project Record Documents.

5. Guarantees and warranties shall be submitted to Architect as specified in General conditions and Section 01 78 30 – Warranties.

6. Contractor's Final Verified Report (Form DSA-6) and other Reports and Affidavits required by the Division of State Architect shall be submitted.

7. Operating and maintenance data shall be submitted and instruction sessions completed as outlined in Section 01 78 23 – Operating and Maintenance Data and as required in CBC 2019 Section 110.3.10.2.

8. Contractor to provide a copy of cleaning and maintenance recommendations for countertops to the underneath side of furniture, in addition to requirements listed above and outlined in Section 01 78 23 – Operating and Maintenance Data.

B. Project Acceptance Requirements, Division of the State Architect:

1. Upon completion of construction of the project, the following reports are required to be submitted before the Division of the State Architect will issue a certification of compliance letter for the work:

   a. A copy of the Notice of Completion filed by the School District.

   b. Final Verified Report Form DSA 6 AE and DSA 6 C certifying all work is 100% complete from the Architect, Structural Engineer, Mechanical Engineer and the Electrical Engineer. Final retention payment shall not be released until DSA 6 C is uploaded into the DSA project file.

   c. Contractor's Documents and Field Reports:

      1) Final Verified Report Form DSA 6 C, certifying all work is 100% complete, from the Contractors (or Contractors), the Inspector of Record, and Special Inspector(s).

      2) Verified Reports of Testing and Inspection as specified on the approved drawings an specifications (i.e., Final Laboratory Report, Welding, Glued-laminated Timber, etc.).

      3) Weighmaster's Certificate (if required by approved drawings and specifications).

      4) If responsibility was changed in any area during construction, the change must be supported by appropriate documentation and termination reports filed by the individuals originally charged with responsibility.

C. Procedure for Project Acceptance:

1. Contractor shall complete all Work as required by the Contract Documents, to the best standards of the industry and the trades involved. It shall be the Contractor's responsibility to provide a new, complete, properly operating, professionally finished, detailed, cleaned, high-quality project. There shall be no loose, untrue, or ill-fitting materials, unsightly gaps, voids, or holes, misalignments, mis-adjustments, shoddy workmanship, or damaged, missing, inoperable, or incomplete work. Work shall be free of smudges, spots, stains, dirt, nicks, tears, cracks, scratches, paint runs, flaws, over sprays, and all other unsightly blemishes.

2. Completion lists and correction lists for items described in the paragraph above, as opposed to short lists of a few minor corrective items that may have inadvertently been missed by the Contractor, shall be the responsibility of the Contractor, and not the Architect, Inspector, or District. By entering into this

Contract, Contractor agrees that quality control is the responsibility of the Contractor. "Punch" list generated by the Architect is under no circumstances to be considered a vehicle to compel subcontractors to complete contract work.

3. Contractor shall prepare a comprehensive and complete list of corrective items for himself and his subcontractors and shall verify that these items have been corrected prior to notifying the Architect of completion. Copies of the Contractor's list(s) shall be made available to the Architect and Inspector upon request.

4. Contractor shall notify the Architect *in writing* when Contractor, with concurrence of Inspector, feels the project is one-hundred percent complete and is ready to leave the Project. Architect shall then commence the construction review and prepare a "Punch List", or list of minor corrective items to be issued to Contractor. For convenience, reviews may be phased for various portions of the work, as each distinct portion becomes one hundred percent (100%) complete.

5. Architect will arrange for Engineering Consultants to make their construction reviews, to be completed before Architect will make his construction review. Contractor and his principal superintendent, authorized to act in behalf of the Contractor, as well as principal subcontractors that the Architect may request to be present, shall accompany the Architect/Engineers during the construction reviews.

6. Excessive amounts of corrective ("punch list") items, as judged by the Architect, shall be grounds to terminate the construction review until such time as the Contractor is deemed sufficiently complete to once again start the review. As a rule of thumb, more than four minor items per typical room will be considered excessive.

7. If Owner elects to occupy the Project after the Contract Completion Date, but before the Contractor has completed the Work, Architect must make a comprehensive construction review prior to Owner's occupancy. Contractor shall reimburse Architect and Engineers for their time in conducting such review, and for the time of their clerical staffs in preparing the review documents, at the Architect's/Engineer's standard hourly rates for extra services. Contractor will be billed at the time of Contractor's Application for Payment. Payments to the Architect not received within 30 days will be deducted from subsequent Contractor's Applications for Payment in accordance with the General Conditions.

8. After completion of "Punch List" work, Contractor shall notify Architect in writing to perform an acceptance tour. Notice shall be issued at least seven (7) days in advance of the time the acceptance tour is to be performed.

9. Contractor and his principal superintendent, authorized to act in behalf of Contractor, as well as principal subcontractors that Architect may request to be present, shall accompany Architect and Inspector on acceptance tour.

   a. If work has been completed in accordance with Contract Documents, and no further corrective measures are required, Architect will issue a Certificate of Substantial Completion, and recommend that Owner accept Project and file Notice of Completion.

   b. If work is judged to be substantially completed in accordance with Contract Documents, and only a few corrective measures are required, Architect will issue a Certificate of Substantial Completion, (Article 64 of

the General Conditions), and recommend that Owner conditionally accept Project and file Notice of Completion. Owner may conditionally accept project and withhold amount for completion per Article 64 of the General Conditions, Contractor shall issue a written notice of intent to complete the corrective measures by a specific named date agreed to by District.

c. If work has not been substantially completed in accordance with Contract Documents, and several or many corrective measures are still required, Architect will recommend that Owner not accept project and not file Notice of Completion. Instead, based on information gathered from acceptance tour, Contractor will be required to complete corrective measures and then call for another project acceptance tour following procedure outlined above. Contractor will compensate Architect and Inspector for additional acceptance tour and deduct amount paid from final payment to Contractor.

10. After Substantial Completion, Contractor shall issue an Application for Payment in accordance with Specification Section 01 29 00, Part 1.03, H. All administrative actions and submittals, including conditions, outlined therein outlined must be complete prior to Owner's release of payment, **and MUST BE COMPLETED PRIOR TO AGENDIZING FOR PROJECT ACCEPTANCE BY THE OWNER'S GOVERNING BOARD.**

11. Upon Contractor completing all administrative actions and submittals, and meeting all conditions, Owner will agendize acceptance of the Work for the next official meeting of the Governing Board. Official action by the Governing Board shall constitute Project Acceptance. Upon acceptance, Contractor shall immediately remove trailers and other remaining temporary facilities.

12. District shall file Notice of Completion with the County Recorder as soon as practicable following Project Acceptance. The date of record for the Notice of Completion shall be the date stamped on the Notice by the Recorder at the time the County Recorder registers the Notice.

13. **The date stamped on the Notice of Completion by the County Recorder shall be the date for commencement of all warranties and guarantees, and the date the Owner becomes responsible for security, maintenance, heating and cooling, utilities, damage to the work (unless done by Contractor's forces working on corrective items), and insurance.**

Contractor shall remain responsible for these items prior to this date.

The Owner will inform the Contractor by letter immediately after receiving confirmation in writing from the Recorder's office of registration of the Notice of Completion. Contractor is hereby notified that the process of registering, stamping, and receipt of confirmation from the County has been known to take as much as four weeks from the time of filing.

14. Upon acceptance of Project by Owner, Contractor shall submit his request for final payment in accordance with Specification Section 01 29 00 – Payment Procedures, Part 1.03, I. Payment of retention will not be made by Owner until 35 days after Notice of Completion has been registered by the County Recorder.

In addition, retention payment will not be made until Contractor has filed the required Form DSA 6 with Division of the State Architect, with copy to the Architect.

PART 2 - PRODUCTS
(Not Applicable)

PART 3 - EXECUTION
(Not Applicable)

END OF SECTION

SECTION 01 78 23

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 SUMMARY:

A. Related Documents: Drawings and general provisions of the Contract, including General and Supplemental Conditions and Division 1 Specifications Sections, apply to this section, and including all Technical Specifications Sections, and the Operating and Maintenance Requirements of Division 26 through Division 28.

B. Section Includes:

1. Compilation of product data and related information appropriate for Owner's maintenance and operation of products and equipment furnished under the Contract per CBC Section 110.3.10.2.

2. Instruction of Owner's personnel in the maintenance of products and in the operation of equipment and systems.

1.02 SUBMITTAL PROCEDURES

A. Preliminary: Submit one copy of proposed manuals to Architect at least fifteen (15) days prior to final inspection or acceptance.

B. Final: Following the indoctrination and instruction of the Owner's operating and maintenance personnel, review proposed revisions to the manual with the Architect.

1. Submit three copies of accepted data in final form ten (10) days after final inspection. Approval of submittal is a pre-requisite at Substantial Completion prior to Owner's agendizing project for acceptance by the Governing Board.

PART 2 - PRODUCTS

2.01 FORMAT

A. Size: Minimum 4 inch, three-ring binders for 8-1/2" x 11" punched pages, completely clear plastic covered for insertion of labels on spines and covers.

B. Provide identifying tabbed pages. Classify by Division and by Section. All tabbing shall be in numerical order.

C. Drawings:

1. Provide reinforced punched binder tab. Bind drawings with text.
2. Fan fold larger drawings to size of text pages, for easy foldout.

D. Cover: Identify each volume with typed or printed label, List:

1. Title of Project
2. Identity of separate structures as applicable.
3. Identity of general subject matter covered in the manual.

E. Spine: Identify each volume with typed or printed label stating OPERATING AND MAINTENANCE INSTRUCTIONS, GUARANTEES AND SERVICE CONTRACTS and the following information:

1. Title of Project.
2. Divisions and Sections included within volume.
3. Volume number (i.e. "1 of 4")

PART 3 - EXECUTION

3.01 CONTENT OF MANUAL

A. Table of Contents:

1. List of each product indexed to the content of the volume.

2. List with each product the name, address, and the telephone number of:

a. Subcontractor and installer.
b. Maintenance contractor, as appropriate.
c. Local sources of supply for parts and replacement.

B. Product Data: Annotate each sheet to clearly identify the data applicable to the installation. Delete references to inapplicable information.

C. Drawings:

1. Supplement product data with Drawings as necessary to illustrate the following:

a. Relationship of component parts of equipment and systems.
b. Control and flow diagrams.

2. Do not include Project Record Drawings as maintenance drawings.

D. Instructions: Provide written text, as required to supplement product data for the particular installation.

E. Warranties, Guaranties, Bonds, and Service Contracts: Include a copy of each warranty, guaranty, bond, and service contract issued.

1. Provide information sheet for Owner's personnel describing the following:

a. Proper procedures in the event of failure or emergencies.

b. Circumstances under which the validity of warranties, guaranties, or bonds might be compromised.

3.02 MANUAL FOR MATERIALS AND FINISHES

A. Instructions for Care and Maintenance: Include Manufacturer's data as follows:

1. Recommendations for types of cleaning agents and methods.

2. Cautions against cleaning agents and methods which are detrimental to the product.

3. Recommended schedule for cleaning and maintenance.

B. Energy Conservation Features:

1. Provide a list of energy conservation features, materials, components, and mechanical devices installed in the building.

3.03 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Content, for each unit of mechanical equipment and system, as appropriate:

1. Description of unit and component parts:

a. Function, normal operating characteristics, and limiting conditions.
b. Performance curves, engineering data, and tests.
c. Complete nomenclature and commercial number of replaceable parts.

2. Operating Procedures:

a. Start-up, break-in, routine, and normal operating instructions.
b. Regulation, control, stopping, shut-down, and emergency instructions.
c. Summer and winter operating instructions.

3. Maintenance Procedures:

a. Routine operations.
b. Guide to "trouble-shooting".
c. Disassembly, repair, and reassembly.
d. Alignment, adjusting, and checking.

4. Servicing and lubrication schedule including list of lubricants required.

5. Manufacturers' printed operating and maintenance instructions.

6. Description of sequence of operation by control manufacturer.

7. Original manufacture's parts list, illustrations, assembly drawings, and diagrams required for maintenance, including:

a. Predicted life of parts subject to wear.
b. Items recommended to be stocked as spare parts.

8. Control diagrams by manufacturer of controls as installed in project.

9. Coordination drawings and color-coded piping diagrams.

10. Charts of valve tag numbers, with the location and function of each valve.

B. Content, for each electric and electronic system as appropriate.

1. Description of system and component parts:

a. Function, normal operating characteristics, and limiting conditions.
b. Performance curves, engineering data, and tests.
c. Complete nomenclature and commercial number of replaceable parts.

2. Circuit directories of panelboards:

a. Electrical service.
b. Controls.

c. Communications.

3. As-installed color-coded wiring diagrams.

4. Operating procedures:

   a. Routine and normal operating instructions.
   b. Sequences required.
   c. Special operating instructions.

5. Maintenance procedures:

   a. Routine operations.
   b. Guide to "trouble-shooting."
   c. Disassembly, repair and reassembly.
   d. Adjustment and checking.

6. Manufacturer's printed operating and maintenance instructions.

7. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

3.04 INSTRUCTION OF OWNER'S PERSONNEL

A. Prior to final inspection or acceptance, fully instruct Owner's designated operating and maintenance personnel in the operation, adjustment and maintenance of all products, equipment, and systems installed in project.

1. Provide services of factory trained instructors from the manufacturer of each major item of equipment or system.

2. Provide for each instruction session or "in-service", a DVD Camcorder operator and **DVD Camcorder** to record the session. DVD recordings shall be clearly labeled as to project, subject, and date. Submit DVDs in triplicate.

B. Operating and maintenance manual shall constitute the basis of instruction.

1. Review contents of manual with personnel in full detail to explain all aspects of operation and maintenance.

2. Review instructions on how to efficiently use state required energy conservation features, materials, components, and mechanical devices.

END OF SECTION

SECTION 01 78 30

WARRANTIES, GUARANTEES, AND BONDS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: General requirements for written warranties, guaranties, and bonds required by the Contract Documents.

B. Referenced Sections:

1. Section 01 77 00 – Closeout Procedures: Submittal of Final Verified Reports and Notice of Completion, as a condition of project acceptance and payment.

2. Section 01 78 39 – Project Record Documents as a condition of project acceptance and payment.

3. Section 01 78 23 – Operation and Maintenance Data: Incorporation of warranties, guaranties, and bonds into instruction manuals.

C. **Approval of the warranties, guaranties, and bonds by the Owner is a prerequisite to payment at Substantial Completion and agendizing for acceptance by the Governing Board of the Owner.**

1.02 TIME PERIOD

A. Deliver manufacturers' warranties, guaranties, and bonds required by Contract Documents, with Owner named as beneficiary. Where manufacturers' warranty or guaranty extends for a longer time period than the Contractor's warranty and guaranty, deliver manufacturer's warranties or guaranties in same manner.

1.03 WARRANTY/GUARANTY FORM

A. Submit written warranties and guaranties, except manufacturer's standard printed warranties and guaranties, on the Contractor's, subcontractors', material suppliers', or manufacturers' own letterhead, addressed to Owner, in the form attached to this Section.

B. Submit warranties and guaranties in duplicate, and in the form indicated, signed by cognizant entities, and by Contractor in every case, with modifications as approved by Owner to suit the conditions pertaining to the warranty or guaranty.

1.04 SUBMITTALS

A. Collect and assemble written warranties and guaranties into bound booklet form, and deliver bound books to Architect for delivery to Owner for final review and approval.

1. See Sections 01 77 00 and 01 78 23 for additional submittal requirements.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

(Not Applicable)

END OF SECTION

ATTACHMENT: Warranty/Guaranty Form

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WARRANTY/GUARANTY FORM

FOR _____ WORK

We, the undersigned, do hereby warranty and guaranty that the parts of the work described above which we have furnished or installed for:

(PROJECT NAME)

are in accordance with the Contract Documents and that all said work as installed will fulfill or exceed all the Warranty and Guaranty requirements. We agree to repair or replace work installed by us, together with any other work which is displaced or damaged by so doing, that proves to be defective in workmanship, material, or operation within a period of _____ ( ) year(s) from the date Notice of Completion is registered with the San Diego County Recorder, ordinary wear and tear and unusual neglect or abuse excepted.

In the event of our failure to comply with the above-mentioned conditions within a reasonable time period determined by the Owner, after notification in writing, we, the undersigned, all collectively and separately, hereby authorize the Owner to have said defective work repaired and/or replaced and made good, and agree to pay to the Owner upon demand all moneys that the Owner may expend in making good said defective work, including all collection cost and reasonable attorney fees.

Date: _____ _____

(Subcontractor, Sub-subcontractor, Manufacturer or Supplier)

By: _____

Title: _____

State License No: _____

Local Representative: For maintenance, repair, or replacement service, contact:

Name: _____

Address: _____

Phone Number _____

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SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Requirements for Record Documents.

B. Throughout progress of the work of the contract, maintain an accurate record of changes in the Contract Documents, as described below.

C. Upon completion of the work of this Contract, transfer the recorded changes to a set of Record Documents, as described herewith.

1.02 QUALITY ASSURANCE

A. General: Delegate the responsibility for maintenance of Record Documents to one person on the Contractor's staff as accepted in advance by the Architect.

B. Accuracy of Records: Thoroughly coordinate changes within the Record Documents, making adequate and proper entries on each page of Specifications and each sheet of drawings and other documents where such entry is required to properly show the change. Accuracy of records shall be such that future searches for items shown in the Contract Documents may reasonably rely on information obtained from the accepted Record Documents.

C. Timing of Entries: Make entries within 24 hours after receipt of information.

1.03 PAYMENT WITHHELD

A. The Architect reserves the right to withhold certification of payment requests for failure on the part of the Contractor to maintain Record Drawings in conformance with this Section.

1.04 SUBMITTALS

A. General: The Architect's review of the current status of Record Documents will be a prerequisite to the Architect's review of requests for progress payment and request for final payment under the contract.

B. Progress Submittals: Prior to submitting each request for progress payment, secure the Architect's review of the Record Documents as currently maintained.

C. Final Submittal: Prior to submitting request for final payment, submit the final Record Documents to the Architect and secure his acceptance.

1.05 PRODUCT HANDLING

A. Maintain the job set of Record Documents protected from deterioration and from loss and damage until completion of the work and transfer of the recorded data to the final Record Documents.

B. In the event of loss of recorded data, use means necessary to again secure the data to the Architect's acceptance; such means shall include, if necessary in the opinion of the Architect, removal and replacement of concealing materials and, in such case, replacements shall be to the standards originally specified in the Contract Documents.

PART 2 - PRODUCTS

2.01 RECORD DOCUMENTS

A. Job Set: Secure from the Owner, at no charge to the Contractor, one complete set of Documents comprising the Contract.

B. Contractor shall provide the architect a pdf copy of all as-builts after the project is completed. As-builts shall include all posted CCDs and RFIs and any other documents issued during construction. As-builts shall be maintained during construction on a daily basis. Any adjustments in location of any item on the plans shall be accurately recorded on the as-built plans.

C. Before commencing backfilling of utilities or any other underground pipes, ducts, conduits, or structures, take photographs showing relationship of below ground utilities to structure(s) or other physical reference point. Provide three-ring binder containing 3-1/2" x 5" mounted and numbered prints of photos, plus the negatives, categorized by locations and indicating utilities shown. Provide a photo(s) of all connections, crossings, stubs, or other critical points. If the Contractor neglects to take such photographs, Contractor shall uncover, at the Contractor's expense, the area(s) so neglected in order to provide the requisite photos.

Provide a hard copy and pdf copy composite Utility Site Plan with the number of each photograph placed on the plan at the location the photo was taken from, and a mark indicating which way the camera was pointed. All numbers and marks shall be in ink, and shall be clear, legible, and neatly done. Photo binder and photo plan shall be considered part of the Record Documents.

D. Survey file, in both PDF format and CAD format with all improvements indicated and certified that all items are constructed to line and grade in accordance with the approved plans.

PART 3 – EXECUTION

3.01 MAINTENANCE OF JOB SET

A. Identification: Upon receipt of the job set, identify each of the documents with a title "RECORD DOCUMENTS-JOB SET".

B. Preservation:

1. Considering the contract completion time, the probable number of occasions upon which the job set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the job set for the review of the Architect.

2. Use the job set for no purpose other than entry of new data and for review by the Architect, until start of transfer of data to final Record Documents.

3. Maintain the job set at the site of work as that site is designated by the Architect.

C. Making Entries on Drawings: Using an erasable colored pencil (not ink nor indelible pencil), clearly describe the change by note and by graphic line, as required. Date entries. Call attention to the entry by a "cloud" around the area or areas affected. In the event of overlapping changes, different colors may be used for each of the changes. In the event of superseding changes to any area of the drawing, erase only that portion of

the preceding change that is affected by the subsequent change before entering the subsequent change.

D. Making Entries on Other Documents:

1. Where changes are caused by directives issued by the Architect, clearly indicate the change by note in ink, colored pencil, or rubber stamp, and reference Division of the State Architect approved addenda and change orders.

2. Where changes are caused by Contractor originated proposals reviewed by the Architect, including inadvertent errors by the Contractor which have been accepted by the Architect, clearly indicate the change by note in erasable colored pencil.

3. Make entries in the pertinent documents as reviewed by the Architect.

4. Reference specifications section 01 77 00, Closeout Procedures, 1.02 (Closeout Schedule and Procedure) paragraph 4. Project Acceptance Requirements, Division of the State Architect for list of documents required at closeout.

E. Conversion of Schematic Layouts:

1. In most cases on the Drawings, arrangement of conduits and circuits, piping, ducts, and other similar items, is shown schematically and is not intended to portray precise physical layout. Final physical arrangement shall be as determined by the Contractor, subject to the Architect's review. However, design of future modifications of the facility may require accurate information as to the final physical arrangement of items and location of utilities which are shown only schematically on the Drawings.

2. Show on the job set of record Drawings, by dimension accurate to within 1 inch, the centerline of each run of items such as are described in the preceding paragraph above. Clearly identify the item by accurate note such as "cast-iron drain", "galvanized water pipe", etc. Show, by symbol or note, the vertical location of the item ("under slab", "in ceiling plenum", "exposed", etc.). Make identification sufficiently descriptive that it may be related reliably to the Specifications.

3. The Architect may waive the requirements for conversion of schematic layouts where, in the Architect's judgment, such conversion serves no beneficial purpose. However, do not rely upon waivers being issued except as specifically issued in writing by the Architect.

4. Timing of Entries: Be alert to changes in the work from how it is shown in the Contract Documents: Promptly, and in no case later than 24 hours after the change has occurred and been made known to the Contractor, make the entry or entries required.

F. Accuracy of Entries: Use means necessary, including proper instruments or tools for measurement, to determine actual locations of the installed items.

3.02 FINAL RECORD DOCUMENTS

A. General: The purpose of the final Record Documents is to provide factual information regarding the work, both concealed and visible, which will enable future modification of design to proceed without lengthy and expensive site measurement, investigation, and examination.

B. Review of Recorded Data Prior to Transfer: Following receipt of the pdf (Blue Beam Review compatible) as-builts described here-in-above, and prior to start of transfer of recorded data thereto, secure a review by the Architect of recorded data. Make required revisions.

C. Transfer of Data to Drawings: Carefully transfer change data shown on the job set of Record Drawings to corresponding sepias, coordinating the changes as required, and clearly indicating at each affected detail and other drawing the full description of changes made during construction and the actual location of items described above. Call attention to each entry by drawing a cloud around the area or areas affected. Make change entries on the as-builts neatly, consistently, and in ink or crisp black pencil.

D. Transfer of Data to Other Documents: If the documents other than drawings have been kept clean successfully during progress of the work, and if entries have been sufficiently orderly thereon and reviewed by the Architect, the job set of those documents (other than drawings) will be accepted by the Architect as the final portion of the record documents. If any such document is not so accepted by the Architect, secure a new copy of that document from the Architect at the Architect's usual charge for reproduction carefully transfer the change data to the new copy and obtain the acceptance of the Architect.

E. Review and Approval: Submit the completed total set of Record Documents in both hard copy and in pdf format to the Architect as described above. Participate in review meeting or meetings as required by the Architect, make required changes in the Record Documents, and promptly deliver the final Record Documents to the Architect.

3.03 CHANGES SUBSEQUENT TO ACCEPTANCE

A. The Contractor shall have no responsibility for recording changes in the work subsequent to acceptance of the work by the Owner, except for changes resulting from replacements, repairs, and alterations made by the Contractor as a part of his guarantee. No changes will be allowed without approval of the Division of the State Architect.

END OF SECTION

SECTION 01 81 13

SUSTAINABLE DESIGN REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Modernization and New Building Scorecard.

1. Point Goal: As indicated
2. Minimum Required Points: 25 points minimum (qualified)

B. A copy of the CHPS Project Scorecard is attached at the end of this Section.

C. Certification Method: CHPS Designed (Self-Certified).

D. Contractor shall be responsible for completion and transmission to Architect, through Construction Manager documents developed during construction (submittals) necessary for completion and verification of the CHPS Scorecard.

1. Other CHPS prerequisites and credits needed to obtain CHPS certification may depend on material selections and other parameters and may not be specifically identified as CHPS requirements. Compliance with requirements needed to obtain CHPS prerequisites and credits shall be used as one criterion to evaluate substitution requests and comparable product requests.

2. Additional CHPS prerequisites and credits needed to obtain the indicated CHPS certification may depend on Architect's design and other aspects of Project that are not part of the Work of the Contract.

3. In case of conflicting requirements, the Work includes coordination with the design and cooperation with the Owner and the construction team as required to achieve the CHPS Scorecard point goal total indicated. The CHPS Scorecard point total shall not be less than the minimum indicated.

E. Related Sections:

1. Division 1 Section "Substitution Procedures."

2. Division 1 Section "Submittal Procedures."

3. Division 1 Section "Product Requirements."

4. Division 1 Section "General Commissioning Requirements."

5. Divisions 2 through 49 Sections for CHPS requirements specific to the work of each of these Sections. Requirements may or may not include reference to CHPS.

1.03 REFERENCES

A. Collaborative for High Performance Schools (CHPS): CHPS Best Practices Manual, Volume III - Criteria, 2009 Edition.

B. Forest Stewardship Council (FSC): FSC STD-01-001, "Principles and Criteria for Forest Stewardship"

C. American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE): ASHRAE 52.2.

D. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA): IAQ Guideline for Occupied Buildings under Construction.

E. US Environmental Protection Agency (EPA): Protocol for Environmental Requirements, Baseline IAQ and Materials, for Research Triangle Park Campus

F. US Environmental Protection Agency (EPA): "Guidelines for Environmentally Preferable Purchasing"

G. Scientific Certification Systems (SCS) Environmentally Preferable Product (EPP) certification program.

H. ISO 14024 Principles and Procedures for Type I Environmental Labeling

I. ASTM E2129 Data Collection for Sustainability Assessment of Building Products

J. California Department of General Service, "California Gold Sustainable Carpet Standard"

1.04 DEFINITIONS

A. Chain-of-Custody Certificates: Certificates signed by manufacturers certifying that wood used to make products was obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship." Certificates shall include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body.

B. CHPS: Collaborative for High Performance Schools (CHPS), 520 9th Street, Suite 100, Sacramento, CA 95814, (415) 957-9888, www.chps.net.

C. Rapidly Renewable Materials: Materials made from plants that are typically harvested within a 10-year or shorter cycle. Rapidly renewable materials include products made from bamboo, cotton, flax, jute, straw, sunflower seed hulls, vegetable oils, or wool. To qualify, a product shall contain a minimum of 25 percent of rapidly renewable materials by weight.

D. Recycled Content: The percentage by weight of constituents that have been recovered or otherwise diverted from the solid waste stream, either during the manufacturing process (post-industrial), or after consumer use (post-consumer):

1. "Post-consumer" material is defined as waste material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product, which can no longer be used for its original intended purpose.

2. Post consumer material does not include manufacturing wastes.

3. "Post-industrial material" (also referred to as pre-consumer or secondary material) is defined as material diverted from the waste stream during the manufacturing process.

4. Spills and scraps from the original manufacturing process that are combined with other

constituents after a minimal amount of reprocessing for use in further production of the same product are not recycled materials.

5. Discarded materials from one manufacturing process that are used as constituents in another manufacturing process are pre-consumer recycled materials.

1.05 DESIGN COMPLIANCE CRITERIA

A. The following design compliance criteria indicated on the CHPS Project Scorecard are directly associated with the Work. Contractor shall comply with the criteria, or shall propose an acceptable alternate method within the CHPS rating system.

B. LEADERSHIP, EDUCATION AND INNOVATION

1. CHPS Credit LEI2.0: Educational Display (Prerequisite)
2. CHPS Credit LIE2.1: Demonstration Areas

C. SUSTAINABLE SITES:

1. Stormwater Management:

a. CHPS Credit SS3.0: Construction Site Runoff Control (Prerequisite):

1) Submit and implement a site-specific Stormwater Pollution Prevention Plan (SWPPP) consistent with US EPA's National Pollution Discharge Elimination System (NPDES). Incorporate Part 2 of the NPDES Construction General Permit: General Permit for Stormwater Discharges from Construction Activities, as well as State, regional and local amendments. Prepare NOI for submittal by Owner.

b. CHPS Credit SS3.1: Limit Stormwater Runoff:

1) Limit the post-development peak stormwater runoff discharge

2. Outdoor Surfaces:

a. CHPS Credit SS4.2: Reduce Heat Islands - Cool Roofs:

1) Provide roofing materials having an initial reflectance of at least 0.70 and initial emittance of at least 0.75 for a minimum of 75% of the roof surface.

2) Reflectance and emittance of proposed roofing materials shall be listed in the Cool Roof Rating Council product directory, and shall have been tested under the CRRC-1 standard.

3. Outdoor Lighting:

a. CHPS Credit SS5.1.2: Light Pollution Reduction:

1) Minimize exterior lighting, minimize impact of lighting off-site and minimize sky glow.

D. WATER:

1. Outdoor Systems:

a. CHPS Credit WE1.0: Water Use Budget (Prerequisite): Comply with water use budget and conform to the local water efficient landscape ordinance.

b. CHPS Credit WE1.1: Reduce potable water for use for non-recreational landscaping areas. Reduce potable water by 50% and install soil moisture meters.

E. ENERGY:

1. Energy Efficiency:

a. CHPS Credit EE1.1.3: Superior Energy Performance:

1) Comply with the requirements of the specified Title 24 report.

b. CHPS Credit EE1.4: Energy Management Systems:

1) Provide training to the maintenance and operations personnel and provide detailed manuals and training aids as indicated.

2) Comply with the requirements of the specified energy management system.

2. Commissioning & Training:

a. CHPS Credit EE3.0: Fundamental Building Systems Testing and Training (Prerequisite):

1) Comply with the requirements of Section 01 91 13 – General Commissioning Requirements for the following commissioning service level:

a) Abbreviated Commissioning, unless Enhanced Commissioning is indicated.

F. MATERIALS:

1. Recycling (Operational):

a. CHPS Credit ME1.0: Storage and Collection of Recyclables (Prerequisite):

1) Provide an area to collect and store paper, cardboard, glass, plastics, metals, and landscaping waste for recycling.

2. Construction Waste Management:

a. CHPS Credit ME2.0: Construction Waste Management (Prerequisite):

1) Recycle, compost and/or salvage at least 50% (by weight) of all non-hazardous construction and demolition debris, unless higher percentage is indicated.

2) Comply with the requirements of Section 02 41 19 and 01 74 00.

b. CHPS Credit ME2.1.1: Construction Site Waste Management:

1) Recycle, compost and/or salvage at least 75% (by weight) of all non-hazardous construction and demolition debris.

2) Comply with the requirements of Section 01 74 00 – Cleaning and Waste Management.

3. Sustainable Materials:

a. CHPS Credit ME4.1.1: Recycled Content-1 Point (Prescriptive Approach):

1) Specify and install at least four (4) materials from Table A4 with the minimum recycled material content indicated in Table A4. These materials are indicated on the CHPS Scorecard.

b. CHPS Credit ME4.2.2: Rapidly Renewable Materials (Prescriptive Approach):

1) Provide rapidly renewable materials, excluding wood fiber, for 50% of the specified interior finish.

c. CHPS Credit ME4.3: Certified Wood:

1) Provide a minimum of 50% (by cost) of wood-based materials in cabinetry using FSC-wood.

G. INDOOR ENVIRONMENTAL QUALITY AND THERMAL COMFORT:

1. Lighting and Daylighting:

a. CHPS Credit EQ1.3: Electric Lighting:

1) Provide high quality and flexible classroom lighting.

2. Indoor Air Quality:

a. CHPS Credit EQ2.0A: Minimum HVAC and Construction IEQ Requirements (Prerequisite):

1) Comply with Part 3 Article "Construction Indoor-Air-Quality-Management".

b. CHPS Credit EQ2.0B: ASHRAE 55 Thermal Comfort Code Compliance and Moisture Control (Prerequisite):

1) Comply with ASHRAE 55-2010 thermal comfort standard and employ moisture control measures to prevent mold growth.

c. CHPS Credit EQ2.0C: Minimum Filtration (Prerequisite):

1) Use HVAC with MERV 8 or greater rated filters throughout the HVAC system.

d. CHPS Credit EQ2.1.2: Enhanced Filtration

1) Use HVAC with MERV 13 or greater rated filters for all air-conditioned student-occupied spaces (MERV ratings are described in ASHRAE 52.2)

e. CHPS Credit EQ2.2: Low-Emitting Materials:

1) For each of the following categories of low-emitting materials indicated on the CHPS Scorecard, provide listed or tested products.

a) Paints.

b) Cabinetry. Cabinetry made with composite wood must have sealed edges.

f. CHPS Credit EQ2.3: Ducted Returns:

1) Provide ducted HVAC return air systems.

g. CHPS Credit EQ2.5: Controllability of Systems

1) Provide a minimum of one operable window in each classroom.

h. CHPS Credit EQ2.6: Chemical and Pollutant Source Control:

1) Provide low-noise, vented range hoods for cooking appliances and chemical mixing areas in lab or prep areas.

3. Acoustics:

a. CHPS Credit EQ3.0: Minimum Acoustic Performance (Prerequisite):

1) Provide classrooms with maximum unoccupied acoustic background noise level of 45 dBA, unless improved acoustic performance is indicated.

2) Provide classrooms with maximum acoustic reverberation time of 0.6 seconds.

1.06 SUBMITTALS

A. General: Submit additional CHPS submittals required by other Specification Sections. Contractor shall be responsible for preparation, coordination and transmission of all documents developed during construction necessary for verification of CHPS Scorecard.

B. CHPS submittals shall address each of the required CHPS items as summarized on the CHPS Scorecard. Refer to the CHPS Scorecard and the list below to determine those items to be included. The list below contains both CHPS items embedded in the design and CHPS items requiring Contractor input. The list shall be expanded or contracted as necessary to match the specified CHPS requirements.

C. CHPS submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate CHPS submittal to verify compliance with indicated CHPS requirements.

D. Following submittal and response for CHPS Initial Submittal Requirements, below, Contractor may include CHPS submittal components as part of the other standard submittals. Standard submittal transmittals shall indicate whether or not the submittal contains CHPS items. CHPS items included with standard submittals shall conform to the CHPS Documentation and Verification Submittal requirements.

E. Contractor shall bundle CHPS Documentation and Verification submittals across Section Division designations, and shall endeavor to assemble bundled CHPS submittals from previously approved standard submittals.

F. Project Materials Cost Data: As required to indicate compliance with CHPS criteria, provide statements indicating total cost for building materials used for Project, excluding mechanical, electrical, and plumbing components, and specialty items such as elevators and equipment. Include statement indicating total cost for wood-based materials used for Project.

1. Comply with the sustainable materials cost guidelines in CHPS Table A5, "Materials to be Included and Excluded from Sustainable Material Calculations."

G. CHPS Initial Submittal (Action Plan), General Requirements: Provide initial (Action Plan) submittals within 14 days of date established for commencement of the Work indicating how the following requirements will be met.

1. Prepare CHPS Action Plan listing applicable CHPS Credits for the Project. The action plan and initial submittals shall indicate how the Contractor intends to comply with the CHPS requirements, and also to identify material changes to the CHPS requirements that may change the final point analysis for the project.

2. Initial submittals shall include enough information to show compliance with indicated CHPS requirements, including, but not limited to, references to specified products or systems, cut sheets demonstrating certifications of listing agencies and submittals equal in all respects to Documentation and Verification submittals.

H. CHPS Initial Submittal (Action Plan), Specific Requirements: For each item indicated on the CHPS Scorecard, submit the following in accordance with special submittals requirements specified above:

1. CHPS Credit LEI2.0 - Educational Display: Provide digital site photos of the installed educational display.

2. CHPS Credit LEI2.1 - Demonstration Areas: Provide digital site photos of the installed demonstration area signage.

3. CHPS Credit SS3.0 & SS3.1 - Construction Site Runoff Control: Proposed Storm Water Pollution Protection Plan (SWPPP).

4. CHPS Credit SS4.2 - Reduce Heat Islands - Cool Roofs: List of proposed products for roofing complying with Cool Roof Rating Council Criteria.

5. CHPS Credit SS5.1 - Light Pollution Reduction: List of proposed products complying with specified lighting fixtures and requirements.

6. CHPS Credit WE1.0 & 1.1 - Water Use Budget: List of proposed products for landscape irrigation.

7. CHPS Credit EE1.4 - Energy Management System: List of proposed products, inspections, field testing and training for specified Energy Management System (EMS).

8. CHPS Credit EE3.0 - Fundamental Building Systems Testing and Training: List of proposed third party field inspection, testing and adjusting of building systems, and scheduled demonstration and training programs for applicable systems.

9. CHPS Credit ME1.0 - Storage and Collection of Recyclables: Proposed permanent waste receptacles for disposal of materials for recycling.

10. CHPS Credit ME2.0 - Construction Waste Management: Waste management procedures during construction complying with specified requirements.

11. CHPS Credit ME2.1 - Construction Site Waste Management: Waste management procedures during construction complying with specified requirements.

12. CHPS Credit ME4.1 - Recycled Content: List of proposed materials with recycled content. Indicate post-consumer recycled content, and pre-consumer recycled content for each product having recycled content.

13. CHPS Credit ME4.2 - Rapidly Renewable Materials: List of proposed materials manufactured with specified minimum percentage of rapidly renewable materials.

14. CHPS Credit ME4.3 – Certified Wood: List of proposed FSC-certified wood building materials and proposed minimum percentage by cost.

15. CHPS Credit ME5.1 - Environmentally Preferable Products: List of proposed materials manufactured with specified environmentally preferable products.

16. CHPS Credit EQ1.3: Electric Lighting: List of proposed products complying with specified lighting fixtures and requirements.

17. CHPS Credit EQ2.0A - Minimum Requirements, Indoor Air Quality: Submit an indoor air quality management plan, including a list of proposed procedures, materials and equipment for achieving good indoor air quality. Address HVAC system basic requirements, HVAC system filtration, construction ventilation procedures, dust protection, building flush -out and post occupancy ventilation.

    a. Indicate compliance with ASHRAE Standard 62.1, "Ventilation for Acceptable Indoor Air Quality

    b. Indicate compliance with the requirements of Part 3, below.

18. CHPS Credit EQ2.0B - ASHRAE 55 Code Compliance: List of products to be used to achieve criteria of ASHRAE 55 thermal comfort criteria.

19. CHPS Credit EQ2.2 - Low-Emitting Materials: List of proposed materials manufactured with low-emission properties.

20. CHPS Credit EQ2.3 - Ducted Returns: List of proposed materials and fabrication procedures for ducted HVAC returns.

21. CHPS Credit EQ2.5 - Controllability of Systems: List of products proposed for operable windows. System description and list of products proposed for individual control of temperature and ventilation in classrooms.

22. CHPS Credit EQ2.6 - Chemical and Pollutant Source Control: List of proposed products and procedures to control dust and segregate pollutant sources, including walk-off mats, isolation partitions and vent hoods.

23. CHPS Credit EQ3.0 - Minimum Acoustical Performance: List of products for control of indoor noise levels.

I. CHPS Documentation and Verification Submittals, General Requirements: Provide complete Documentation and Verification Submittals indicating compliance with all indicated CHPS requirements.

    1. These submittals shall include, but are not limited to, product data, shop drawings, samples, test reports, calculations, certifications, listings, installation instructions and other information necessary to demonstrate and verify compliance with the CHPS criteria

J. CHPS Documentation and Verification Submittals, Specific Requirements: For each item indicated on the CHPS Scorecard, submit the following in accordance with special submittals requirements specified above:

    1. CHPS Credit SS3.0 - Construction Site Runoff Control: Submit approved Storm Water Pollution Protection Plan (SWPPP).

    2. CHPS Credit SS4.2 - Reduce Heat Islands - Cool Roofs: Submit product data for

installed roofing, including Cool Roof Rating Council identification number and approval of roofing system.

3. CHPS Credit SS5.1 - Light Pollution Reduction: Submit product data for installed outdoor lighting, including photometric data demonstrating compliance with specified fixtures or CCR Title 24 site lighting model.

4. CHPS Credit EE3.0 - Fundamental Building Systems Testing and Training: Submit recorded results of third party field inspection, testing and adjusting of building systems. Submit training materials used in demonstration and training programs for applicable systems.

5. CHPS Credit ME1.0 - Storage and Collection of Recyclables: Submit product data for installed permanent waste receptacles for disposal of materials for recycling.

6. CHPS Credit ME4.1.1 and ME4.1.3: - Recycled Content: Submit product data and certification letters for products and materials with recycled content incorporated in the construction. Indicate postconsumer recycled content and pre-consumer recycled content for each product having recycled content, in compliance with requirements of CHPS Table A4.

7. CHPS Credit ME4.2 - Rapidly Renewable Materials: Submit product data for all rapidly renewable materials incorporated into the project. For performance based compliance, submit the total cost of all CHPS qualifying materials and the total cost of all rapidly renewable materials.

8. CHPS Credit ME4.3 – Certified Wood: Submit product data and chain-of-custody certificates for products containing FSC-certified wood. Include statement indicating cost for each certified wood product. Submit the total cost of all certified wood materials and the total cost of all new wood based materials incorporated into the project.

9. CHPS Credit EQ1.3: Electric Lighting: Submit product data and system operation information for all light fixtures, switches and lighting control products incorporated into the project.

10. CHPS Credit EQ2.0 - Minimum Requirements, Indoor Air Quality: Submit record of procedures, materials and equipment used to achieve general indoor air quality, flush-out of indoor air prior to occupancy and HVAC system basic requirements. Include the following:

    a. Construction indoor-air-quality management plan.

    b. Product data for temporary filtration media.

    c. Product data for permanent filtration media used during occupancy.

    d. Signed statement describing the building air flush-out procedures including the dates when flush-out was begun and completed and statement that filtration media was replaced after flush-out.

11. CHPS Credit EQ2.0B - ASHRAE 55 Code Compliance: Submit product data for products incorporated in construction used to achieve criteria of ASHRAE 55-2004 thermal comfort criteria. Submit third party field test results demonstrating compliance with specified criteria.

12. CHPS Credit EQ2.2 - Low-Emitting Materials: Submit product data for products and materials manufactured with low-emission properties and incorporated in the construction. Submit certifications or test reports for each product indicating that they meet the specified requirements.

13. CHPS Credit EQ2.5: Controllability of Systems: Submit product data for system used for individual control of temperature and ventilation in classrooms. Operable Windows at Classrooms: Submit product data for operable windows.

14. CHPS Credit EQ2.6 - Chemical and Pollutant Source Control: Submit product data for products and procedures used during construction to control dust and segregate pollutant sources.

15. CHPS Credit EQ2.3 - Ducted Returns: Submit project record drawings and product data for fabrication and construction of ducted HV AC returns.

16. CHPS Credit EQ3.0 - Minimum Acoustical Performance: Submit product data for products for incorporated into construction to control indoor noise levels. Submit third party field test results demonstrating compliance with specified criteria.

17. CHPS Credit EQ2.0B - ASHRAE 55 Code Compliance: Submit product data for products incorporated in construction used to achieve criteria of ASHRAE 55-2004 thermal comfort criteria. Submit third party field test results demonstrating compliance with specified criteria.

1.07 QUALITY ASSURANCE

A. CHPS Coordinator: Engage an experienced Professional to coordinate CHPS requirements. CHPS coordinator may also serve as waste management coordinator.

PART 2 - PRODUCTS

2.01 CERTIFIED WOOD:

A. CHPS Credits ME4.3: Certified Wood: Provide a minimum of 50 percent (by cost) of wood-based materials that are produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

1. Wood-based materials include, but are not limited to, the following materials when made from wood, engineered wood products, or wood-based panel products:

a. Rough carpentry.
b. Miscellaneous carpentry.
c. Heavy timber construction.
d. Wood decking.
e. Metal-plate-connected wood trusses.
f. Structural glued-laminated timber.
g. Finish carpentry.
h. Architectural woodwork.
i. Wood paneling.
j. Wood veneer wall covering.
k. Wood flooring.
l. Wood lockers.
m. Wood cabinets.
n. Furniture.

2.02 LOW-EMITTING MATERIALS:

A. CHPS Credit EQ 2.2.: Low-emitting Materials: For products that are inside the weatherproofing system, provide products that comply with one or more of the following:

1. Low-emitting products that are listed by one or more of the following:

a. CHPS, "Low-Emitting Materials Product List."

b. Carpet & Rug Institute, "Green Label Plus."

c. Scientific Certification Systems (SCS), "Indoor Advantage Gold."

d. Scientific Certification Systems (SCS), "Floorscore."

e. Greenguard Environmental Institute, GREENGUARD Gold Certifications, formerly known as "Greenguard Certified for Children and Schools."

2. Low-emitting products that have been satisfactorily tested in conformance with one or more of the following:

a. CA Department of Health Services (DHS) "Standard Practice for Testing of VOCs from Various Sources Using Small-scale Environmental Chambers".

PART 3 - EXECUTION

3.01 CONSTRUCTION WASTE MANAGEMENT:

3.02 CONSTRUCTION INDOOR-AIR-QUALITY MANAGEMENT:

A. CHPS Credit EQ2.0: Minimum Requirements, Indoor Air Quality: Comply with ASHRAE Standard ASHRAE Standard 62.1-2004, Chapter 7 during construction and system startup, including the following:

1. Protection of materials.
2. Air balancing.
3. Testing of drain pans.
4. Comply with the requirements of the following paragraphs.

B. Temporary Construction Ventilation: Continuously ventilate during installation of materials that emit Volatile Organic Compounds (VOC) and after installation until emissions dissipate. Ventilate areas directly to outside areas; do not ventilate to other enclosed spaces.

1. Comply with requirements for use of HVAC systems during construction if permanent HVAC are used.

2. If continuous ventilation is not possible via the building's HVAC system(s), then ventilate via open windows and temporary fans that sufficiently provide no less than three air changes per hour.

C. Dust Protection: Turn the ventilation system off, and protect HVAC supply and return openings from dust infiltration during dust producing activities (e.g. drywall installation and finishing).

D. Pre-Conditioning: Allow products that have odors and significant VOC emissions to off-gas in dry, well-ventilated space for a sufficient period to dissipate odors and emissions prior to delivery to the construction site or flush out. Condition products without containers and packaging to maximize off-gassing of VOCs. Condition products in a ventilated warehouse or other building. Comply with substitution requirements for consideration of other locations.

E. Sequencing: Where odorous and/or high VOC-emitting products are applied on-site, apply them prior to installation of porous and fibrous materials including foams.

F. Vacuuming: Vacuum carpeted and other accessible surfaces (use a CRI Green Label certified vacuum or HEPA vacuum that meets or exceeds the CRI criteria for vacuum cleaning performance) after construction is complete and prior to occupancy.

G. Initial Duct Cleaning: Oil film on sheet metal should be removed before shipment to site. On-site, inspect ducts to confirm that no oil film is present. Remove any oil. If ducts contain dust and dirt, clean them immediately, prior to preliminary completion and prior to using the ducts to circulate air.

H. Building Flush-out: Flushing out the building with 100% outside air will help remove indoor pollutants prior to occupancy. After construction ends, and with all interior finishes installed, flush-out the building by supplying continuous ventilation with all air handling units at their maximum outdoor air rate for at least 14 days while maintaining an internal temperature between 60°F and 78°F, and relative humidity no higher than 60%. Occupancy may start after 7 days, provided flush-out continues for the full 14 days. Do not "bake out" the building by increasing the temperature of the space.

1. If continuous ventilation is not possible, flush-out must total the equivalent of 14 days of maximum outdoor air.

I. Post-occupancy Ventilation: When the contractor is required to perform touch-up work involving products with chemical emissions, provide temporary construction ventilation during installation and extend the building flush-out by a minimum of 4 days after touch-up installation, with 100% tempered outside air for 24 hours each day.

J. Air-Quality Testing:

1. If the requirements of paragraphs 3.2.A through 3.2.J, above, inclusive, are not rigorously met, the Owner may request the following air quality testing as a preliminary remedial action. Contractor shall bear the expense of this remedial testing.

   a. Owner may optionally request this testing. Owner shall bear the cost of optional (non-remedial) testing.

2. Conduct baseline indoor-air-quality testing, after construction ends and prior to occupancy, using testing protocols consistent with the EPA's "Compendium of Methods for the Determination of Air Pollutants in Indoor Air."

3. Demonstrate that the contaminant maximum concentrations listed below are not exceeded:

   a. Formaldehyde: 50 ppb.

   b. Particulates (PM10): 50 micrograms/cu. m.

   c. Total Volatile Organic Compounds (TVOC): 500 micrograms/cu. m.

   d. 4-Phenylcyclohexene (4-PH): 6.5 micrograms/cu. m.

   e. Carbon Monoxide: 9 ppm and no greater than 2 ppm above outdoor levels.

4. For each sampling point where the maximum concentration limits are exceeded, conduct additional flush-out with outside air and retest the specific parameter(s) exceeded to indicate the requirements are achieved. Repeat procedure until all requirements have been met. When retesting noncomplying building areas, take samples from same locations as in the first test.

5. Air-sample testing shall be conducted as follows:

   a. All measurements shall be conducted prior to occupancy but during normal occupied hours and with building ventilation system starting at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the duration of the air testing.

b. Building shall have all interior finishes installed including, but not limited to, millwork, doors, paint, carpet, and acoustic tiles. Moveable furnishings such as workstations and partitions are encouraged, but not required, to be in place for the testing.

1) Number of sampling locations will vary depending on the size of building and number of ventilation systems. For each portion of building served by a separate ventilation system, the number of sampling points shall not be less than one per 25,000 sq. ft. or for each contiguous floor area, whichever is larger, and shall include areas with the least ventilation and greatest presumed source strength.

2) Air samples shall be collected between 3 and 6 feet from the floor to represent the breathing zone of occupants, and over a minimum four-hour period.

c. Initial testing shall be performed at Owner's discretion. If contaminant maximum concentrations listed above are exceeded, Contractor shall perform the necessary repairs, replacements and corrections as required to meet the minimum indoor air quality standards. Contractor shall pay for cost of all retesting.

END OF SECTION

SECTION 01 91 13

GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. District's Project Requirements and Basis-of-Design documentation are included by reference for information only.

1.02 SUMMARY

A. Section Includes:

1. General requirements for coordinating and scheduling commissioning.
2. Commissioning Team duties.
3. Commissioning meetings.
4. Commissioning scheduling.
5. Test equipment, instrumentation, and tools for commissioning.
6. Construction verification.
7. Functional performance testing.
8. Commissioning tests and commissioning test demonstration.
9. Commissioning Report.

B. Related Requirements:

1. Section 01 33 00 "Submittal Procedures" for submittal procedures requirements for commissioning.

2. Section 01 77 00 "Closeout Procedures" for certificate of Construction Phase Commissioning Completion submittal requirements.

3. Section 01 78 23 "Operation and Maintenance Data" for preliminary operation and maintenance data submittal.

1.03 DEFINITIONS

A. Acceptance Criteria: Threshold of acceptable work quality or performance specified for a commissioning activity, including, but not limited to, construction checklists, performance tests, performance test demonstrations, commissioning tests and commissioning test demonstrations.

B. Basis-of-Design: A detailed description of building Design criteria, parameters, set-points, concepts, decisions and selections used to meet the District's Project Requirements that serves as a basis for review, approval and documentation of the Design process used for all building systems.

C. Commissioning Agent: A District appointed entity that plans and coordinates all activities that implement commissioning as outlined by District's Basis of Design.

D. Commissioning Plan: A document, prepared by Commissioning Agent, that outlines the organization, schedule, allocation of resources, and documentation requirements of commissioning.

E. Commissioning Report: A document, prepared by the Commissioning Agent, that records the activities and results of the Commissioning process.

F. Commissioning: The process of ensuring that systems are designed, installed, functionally tested and performing in conformity with the District's Requirements and that the District has received complete equipment/systems documentation and training.

G. Construction Verification: A quality control verification process performed by the installer as building assemblies, components, equipment and systems are being installed that documents that the materials, installation procedures, interfaces with other trades, start-up, testing and operations are correct, complete, in compliance with Contract Documents and manufacturer's recommendations and are ready for Functional Performance Testing.

H. District's Project Requirements: A narrative of the program, use and functional requirements of the building with a description of the Project goals and criteria in general categories (e.g.: flexibility of use, ease of maintenance, future expansion, etc.) and specific categories (e.g.: specialized environments, specific sustainable features, quality of materials, etc.).

I. Functional Performance Tests: Contractor testing of installed building assemblies, components, equipment, systems and interfaces which confirms correct performance through all operating modes and compliance with Contract Documents, manufacturer's recommendations and the District's Project Requirements.

J. Retro-Commissioning: A systematic process for improving and optimizing a building's operations and supporting those improvements with enhanced documentation and operator training.

K. Test: Performance tests, performance test demonstrations, commissioning tests, and commissioning test demonstrations.

1.04 ABBREVIATIONS

A. The following abbreviations are used in this Section:

1. A/E Architect / Engineer.
2. BAS: Building Automation System.
3. Cx: Commissioning.
4. CxA: Commissioning Agent.
5. DPR: District's Project Requirements.
6. FPT: Functional Performance Tests.
7. O&M: Operations and Maintenance.
8. PI: Project Inspector.
9. PPO: Physical Plant Operations
10. P/T: Pressure / Temperature.
11. TAB: Testing, Adjusting, and Balancing.

1.05 COMMISSIONING TEAM DUTIES

Cx TASK	Provided By	Provided To	Planning	Design	Constructio	Turnover	Operation

	DISTRICT	PI	A/E	CxA	CONTRACTOR	PPO	PI	A/E	CxA	CONTRACTOR			n		
District's Project Requirements				X		X	X	X		X	PPO Narrative	Update	Update	Update, Include in Cx Report	
	X	X	X						X		Review Comments on PPO	Additional Comments on PPO	Additional Comments on PPO	Additional Comments on PPO	
Basis of Design			X			X	X		X		Basis of Design	Update	Update	Update	
	X	X		X				X			Review Comments	Additional Comments	Additional Comments	Additional Comments	
				X		X	X	X		X				Include in Cx Report	
Cx Plan				X		X	X	X		X	Cx Plan	Update	Update	Update, Include in Cx Report	Update, Include in Cx Report
	X	X			X				X		Review Comments	Additional Comments	Additional Comments	Additional Comments	Additional Comments
Construction Verification Checklists and Checklist Tracking Report					X	X			X				Edit and Develop		
					X	X			X				Perform and Submit as Work is Installed	Include in O&M Manuals	
	X			X						X			Review Comments		
Functional Performance Tests and FPT Tracking Report					X	X			X				Develop & Update Test Forms, Schedule and Direct Tests	Include in Cx Report	
					X	X			X				Perform and Submit		
	X			X						X			Review Comments		
Cx Report				X		X	X	X		X				Draft Report	Final Report
Cx Issues, Site Visit and Closeout Items Log				X		X	X	X		X	Cx Issues, Site Visit & Closeout Log	Update	Update	Update	
					X				X				Actions Taken	Actions Taken	
PPO Training					X	X	X	X	X				O&M Data, Training		

Cx TASK	Provided By					Provided To					Planning	Design	Construction	Turnover	Operation
	DISTRICT	PI	A/E	CxA	CONTRACTOR	PPO	PI	A/E	CxA	CONTRACTOR					
													Plan and Training		
		X		X						X			Evaluate O&M Data & Training		

1.06 INFORMATIONAL SUBMITTALS

A. Comply with requirements in Section 01 33 00 "Submittal Procedures" for submittal procedures general requirements for commissioning.

B. Lists:

1. Construction Verification List.

a. Select appropriate lists from Appendix A.

2. Function Performance Tests List.

a. Select appropriate lists from Appendix C.

C. Forms:

1. Construct Verification Tracking Report.

a. See Appendix B.

2. Functional Performance Test Tracking Report.

a. See Appendix D.

PART 2 - PRODUCTS

2.01 TEST EQUIPMENT, INSTRUMENTATION, AND TOOLS

A. Provide equipment required to perform startup, checkout and testing. Provide equipment that has been calibrated per the manufacturer's recommendations within the past year.

PART 3 - EXECUTION

3.01 COMMISSIONING PLAN

A. Assist District's Commissioning Agent in development of a complete commissioning plan detailing the following information at a minimum:

1. Contact information for key members of commissioning team.

2. Description of procedures to be utilized for each commissioning task.

3. List of commissioning systems and associated equipment.

4. Functional Performance Test sampling approach to be utilized for repeat equipment items.

5. List of responsibilities for each party involved in the commissioning process.

6. Commissioning milestones and schedule.

B. Commissioning Meetings:

1. Attend commissioning meetings with involved subcontractors and other personnel requested by CxA. Each party is responsible for providing a review of Project progress, commissioning issues and scheduling for future commissioning tasks.

C. Communication:

1. Relay communications resulting from or in relation to commissioning activities directly to the responsible party whenever possible, with copies to District Construction Manager and Project Inspector.

D. Responsibilities:

1. All parties are to follow the Commissioning Plan and are responsible for commissioning activities as outlined in Article "Commissioning Team Duties."

E. Scheduling:

1. Provide CxA and involved subcontractors with a copy of the Project Schedule and regular monthly updates. CxA will provide Contractor with a detailed schedule of commissioning tasks for incorporation into project schedule.

F. Construction Verification:

1. The purpose of the Construction Verification List is to have a formal means of providing individual workers the key criteria for a successful installation and to easily track construction progress.

2. Notify CxA five days prior to construction verification so that CxA may witness, as deemed necessary, each assembly, component, equipment, system start up and testing.

3. If CxA identifies more than a 10 percent discrepancy rate, revalidate all items covered by that checklist and resubmit new checklists.

G. Functional Performance Testing:

1. Assist CxA in establishing a schedule for Functional Performance Testing.

2. Ensure all subcontractors involved with specific assemblies, components, equipment, systems and interfaces have qualified installers and technicians present at the same time working together to perform testing and demonstrate correct performance through all operating and failure modes and compliance with Contract Documents, manufacturer's recommendations and the District's Project Requirements.

3. Ensure completion and coordination of the Work prior to testing. Preplan testing procedures, and ensure necessary staff and resources are on hand for expediting testing. Failure to complete or coordinate work, preplan, or have staff and resources available to carry out testing will result in retesting.

4. CxA will establish sampling protocol and, at the time of testing, select sample test locations for identical pieces of equipment. Receive CxA approval where simulation of conditions or altering of set points or values is required to achieve an opening or failure mode for testing.

5. Correct minor deficiencies during testing. Deficiencies that cannot be corrected during testing will be documented and subject to retest. Retesting will continue until no deficiencies remain.

6. The cost of retesting is the responsibility of the Contractor and subject to deductive change order. Deficiencies and retesting are the responsibility of the Contractor and are not subject to time extensions or delay claims. Review preliminary construction checklists and preliminary test procedures and data forms.

3.02 OPERATION AND MAINTENANCE DATA

A. Provide as specified in Section 01 78 23 "Operation and Maintenance Data."

3.03 COMMISSIONING REPORT

A. CxA will provide Contractor, Architect, and District a Commissioning Report for the Project upon Substantial Completion. This report will include contact information for key members of the commissioning team; description of commissioned systems, commissioning activities, sampling protocol and results. The report will also include the District's Project Requirements, Basis-of-Design, Construction Verification Checklist Tracking Report, and Functional Performance Test Tracking Report.

END OF SECTION

APPENDIX A – CONSTRUCTION VERIFICATION LIST

Choose from the following Construction verification checklists and provide additional items as needed to reflect the verification Requirements of assemblies, components, equipment and systems to be commissioned on this Project and used on the Construction Verification Tracking Report.

CV-22 05 14 – Backflow Preventers
CV-22 05 14 – Trap Primer Values
CV-22 07 00 – Plumbing Insulation
CV-22 11 00 – Water Distribution
CV-22 13 00 – Sanitary Sewage
CV-22 14 00 – Storm Drainage
CV-22 30 00 – Expansion Tanks
CV-22 30 00 – In-line Centrifugal Pumps
CV-22 30 00 – Water Heaters (Electric)
CV-22 30 00 – Water Heaters (Gas)
CV-22 42 00 – Plumbing Fixtures
CV-22 60 00 – Air Compressors
CV-23 05 14 – Variable Frequency Drives
CV-23 05 15 – Air Separators
CV-23 05 15 – Expansion Tanks
CV-23 05 15 – Suction Diffusers
CV-23 07 00 – HVAC Ductwork Insulation
CV-23 07 00 – HVAC Piping Insulation
CV-23 09 14 - Air Compressors
CV-23 09 14 - Control Wiring and Devices
CV-23 11 00 - Gas Piping
CV-23 21 13 - Hydronic Piping
CV-23 21 13 - Pumps
CV-23 23 00 - Refrigerant Piping / VRF, VRV
CV-23 25 00 - HVAC Water Treatment
CV-23 31 00 - Ductwork and Casings
CV-23 34 00 - Ceiling Exhaust Fans
CV-23 34 00 - Centrifugal Fans
CV-23 34 00 - Destratification Fans
CV-23 34 00 - Vaneaxial Fans
CV-23 36 00 - Air Terminal Units
CV-23 37 13 - Diffusers, Grilles and Registers
CV-23 41 00 - Filter Racks
CV-23 52 00 - Cast Iron or Modular Cast Iron Boiler
CV-23 52 00 - Fire Box, Fire Tube, Flexible Water Tube or Vertical Tubeless Boilers
CV-23 54 00 - Gas Fired Furnaces
CV-23 55 00 - Direct Fired MUA Units
CV-23 55 00 - Gas Fired Unit Heaters
CV-23 55 00 - Indirect Fired MUA Units
CV-23 62 13 - Air Cooled Chillers
CV-23 64 15 - Water Cooled Chillers
CV-23 73 12 - Refrigerant Coils
CV-23 82 00 - Fan Coil Units
CV-23 82 00 - Reheat Coils
CV-23 82 00 - Unit Heaters
CV-23 82 00 - Unit Ventilators
CV-26 05 13 - Medium Voltage Cables
CV-26 05 26 - Grounding and Bonding
CV-26 05 33 - Conduit, Raceway & Boxes for Electrical Systems
CV-26 05 36 - Cable Trays
CV-26 18 23 - Medium Voltage Surge Arrestor

CV-26 22 00 - Low Voltage Transformer
CV-26 24 13 - Switchboard
CV-26 24 16 - Panelboards
CV-26 27 13 - Electrical Meter
CV-26 27 28 - Non-Fusible Disconnect Switches
CV-26 28 16 - Enclosed Switches and Circuit Breakers
CV-26 29 00 - Magnetic Motor Starters
CV-26 29 00 - Manual Motor Starters
CV-26 29 00 - Motor Control Centers
CV-26 36 00 - Automatic Transfer Switches
CV-26 43 13 - Transient Voltage Suppression
CV-26 51 13 - Interior Light Fixtures, Lamps & Ballasts
CV-26 51 15 - Lighting Control Panels
CV-26 56 29 - Site Lighting
CV-27 00 00 - Communications Cabling
CV-28 31 00 - Fire Alarm Control Panels
CV-28 31 00 - Fire Alarm Wiring & Devices

APPENDIX B – CONSTRUCTION VERIFICATION TRACKING REPORT

Fill out the following tracking report using Construction Verification List for this Project.

Construction Verification Checklist No.	Equipment/System Type	No. of Equip., Areas (floors, etc.) or Groups	Checklists Tracking	
			Total Checklists	Complete to Date

APPENDIX C – FUNCTIONAL PERFORMANCE TEST LIST

Choose from the following Functional Performance Test list and provide additional items needed to reflect the Testing Requirements of assemblies, components, equipment and systems to be commissioned on this Project and used on Functional Performance Test Tracking Report.

FPT-22 30 00 - Domestic Booster Pumps
FPT-22 30 00 - Inline Centrifugal Pumps
FPT-22 30 00 - Water Heaters
FPT-23 05 14 - Variable Frequency Drives
FPT-23 09 23 - EMS Communication/Calibration
FPT-23 21 13 - Pumps
FPT-23 34 00 - HVAC Fans
FPT-23 36 00 - Air Terminal Units
FPT-23 52 00 - Boiler
FPT-23 54 00 - Gas Fired Furnaces
FPT-23 55 00 - Direct Fired MUA Units
FPT-23 55 00 - Gas Fired Unit Heaters
FPT-23 62 13 - Air-Cooled Chillers
FPT-23 64 15 - Water Cooled Chillers
FPT-23 73 13 - Air Handling Units/VRF, VRV
FPT-23 82 00 - Cabinet Heaters
FPT-23 82 00 - Fan Coil Units
FPT-23 82 00 - Re-Heat Coils
FPT-23 82 00 - Unit Heaters
FPT-26 51 15 - Lighting Controls

APPENDIX D – FUNCTIONAL PERFORMANCE TEST TRACKING REPORT

Fill out the following tracking report using the Functional Performance Test List for this Project.

Functional Performance Test No.	Equipment/System Type	No. of Equip., Areas (floors, etc.) or Groups	Test Tracking	
			Total Tests	Complete to Date

02 00 00

SITE WORK

SANTEE SCHOOL DISTRICT

SECTION 02 41 19

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes: Project site and building demolition work to prepare for addition of new improvements, as indicated on the Drawings and specified herein. General and Special Conditions and Division 1 specification sections apply to this section.

B. Related Sections:

1. Section 01 73 29, Cutting and Patching
2. Section 01 50 00, Temporary Facilities and Controls
3. Section 01 77 00, Closeout Procedures

1.02 DEFINITIONS

A. "Remove": Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the Owner's property.

B. "Removed and Salvaged": Items to remain the Owner's property shall be removed, cleaned, and packed or crated to protect against damage.

1. Identify contents of containers and deliver to Owner's designated storage area.

C. "Existing to Remain" Protect construction indicated to remain against damage and soiling during demolition. When permitted by the Architect, items may be removed to a suitable, protected storage location during demolition and then cleaned and reinstalled in their original locations.

D. "Remove and Reinstall": Remove items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in locations indicated.

E. Salvaged Materials (not wanted by Owner): Items which the Owner does not want and is of salvable value to Contractor may be removed from structure as work progresses. Owner and CBC require a minimum of 50% (by weight) of all non-hazardous construction materials be recycled, composted and/or salvaged. Salvage shall conform to the following:

1. Contractor shall submit salvage plan showing how all materials are to be sorted, salvaged and recycled. Plan must include all final destinations for each type of material.

2. Salvaged items must be transported from site as they are removed, unless materials are to be reused on site.

3. Storage or sale of removed items on site will not be permitted, unless materials are to be reused on site.

4. Contractor shall provide certification for all salvaged materials. Certifications may take the form of receipts from recycling facilities, manufacturers, or any other legitimate form of certification. Certification types shall be outlined in salvage plan and approved by Owner.

1.03 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition by the Contractor(s) in a legal disposal area appropriate to the materials being disposed.

1.04 SUBMITTALS

A. Submit each item in this Article according to the Conditions of the Contract and Specifications Section 01 33 00, unless otherwise indicated.

B. Proposed Dust Control Measures.

C. Proposed Noise Control Measures.

D. Schedule of demolition activities indicating the following:

1. Detailed sequence of demolition, salvage, and removal work, with starting and ending dates for each activity.

2. Dates for shutoff, capping, and continuation of utility services.

E. Salvage Plan - Inventory of items to be removed and salvaged. Salvage plan shall show how all materials are to be sorted, salvaged and recycled. Plan must include all final destinations for each type of material.

F. Inventory of items to be removed and salvaged and deliver to Owner's designated storage area.

G. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and improvements that might be misconstrued as damage caused by demolition operations.

H. Record drawings at project closeout according to Specification Section 01 77 00 - Closeout Procedures shall identify and accurately locate capped utilities and other subsurface structural, electrical, or mechanical conditions.

1.05 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Engage an experienced firm that has successfully completed demolition work similar to that indicated for this Project.

B. Regulatory Requirements: Comply with governing EPA notification regulations before starting demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Pre-demolition Conference: Conduct conference at Project site with Owner, Architect and Construction Manager.

1.06 PROJECT CONDITIONS

A. Building, where partial wall will be demolished, will be vacated and its use discontinued before start of the Work.

B. Conditions, existing at time of inspection for bidding purpose, will be maintained by Owner as far as practical.

C. Hazardous Materials: If applicable, a Hazardous Materials Study was performed on site and a specification for removal of said materials is incorporated into the project documents.

1.07 SCHEDULING

A. Arrange demolition and salvage schedule so as not to interfere with Owner's on-site operations.

PART 2 - PRODUCTS
(Not Applicable)

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicted to determine extent of demolition required.

C. Inventory and record the conditions of items to be removed and reinstalled and items to be removed and salvaged.

D. Survey condition of the building to determine whether removing any element might result in a structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during demolition.

E. Perform surveys as the Work progresses to detect hazards resulting from demolition activities.

3.02 UTILITY SERVICES

A. Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.

B. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by Owner, and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to governing authorities.

C. Provide not less than 72 hours notice to Owner if shutdown of service is required during changeover.

D. Utility Requirements: Refer to Division 21 through Division 26 sections for shutting-off, disconnecting, removing, and sealing or capping utility services. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.03 PREPARATION

A. Conduct demolition operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

B. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around demolition area.

1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways.

2. Protect existing site improvements, appurtenances, and landscaping to remain.

C. Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of building to remain.

1. Strengthen or add new supports when required during progress of demolition.

3.04 EXPLOSIVES

A. The use of explosives will not be permitted.

3.05 POLLUTION CONTROLS

A. Use water mist, temporary enclosures, and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.

1. Do not create hazardous or objectionable conditions, such as flooding, and pollution, when using water.

B. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level.

C. Clean adjacent buildings and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing before start of demolition.

3.06 DEMOLITION

A. Demolish partial building wall, concrete and/or asphalt paving, interior finishes, fixtures and accessories, as required to prepare for new construction, and remove from the site.

B. Locate demolition equipment throughout the building and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

C. Dispose of demolished items and materials promptly. On-site storage or sale of removed items is prohibited.

D. Promptly repair damages to adjacent facilities caused by demolition operations.

3.07 DISPOSAL OF DEMOLISHED MATERIALS

A. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Burning demolished materials is not allowed.

C. Transport demolished materials off Owner's property and legally dispose of these materials.

END OF SECTION

03 00 00

CONCRETE

SANTEE SCHOOL DISTRICT

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes: Completion of sand bed, vapor barrier, cast-in-place concrete, and finishes as indicated on the drawings and specified herein.

1.02 QUALITY ASSURANCE/SUBMITTALS

A. Conform with the requirements of Section 01 45 23 - Testing and Inspection Services.

B. Perform concrete work in accordance with ACI 301 and 318, unless specified otherwise. Provide continuous inspection and testing for concrete placement in accordance with Sections 1701A and 1913A Title 24, Part 2, California Building Code.

C. Sample Panels: When and where instructed to do so, provide on-site sample panel with specified finishes. Construct additional panels as may be necessary to gain approval of finishes desired. After rejection of panel, remove from site immediately. Approved and reviewed panel is to be left in place at site for project duration as a project standard.

D. Testing Laboratory Services:

1. Owner will employ and pay for an Independent Testing Laboratory to review the various concrete mixes required to produce concrete of the strengths required for the project. Submit and obtain approvals before proceeding with the work. Concrete mix shall be designed per Title 24, Part 2, Section 1904A.2

2. Separately, Owner will employ and pay for a testing laboratory to perform tests and inspections, but the cost of subsequent and additional testing and inspections due to failed items will be back charged to the Contractor.

E. Submit design mixes to Architect for Structural Engineer, and Testing Lab review and approval. Contractor shall pay for review of more than two (2) designs for each strength required.

F. Submit shrinkage test for each design minimum. Perform the following shrinkage tests for lightweight concrete, for each 150 cubic yards and fraction:

1. Specimens - 4-inch x 4-inch and 11-inch-long bars, cured for seven (7) days in a moist room and as specified in ASTM C157. Make measurements at 7-day intervals until 35 days of curing has elapsed.

2. Allowable shrinkage of lightweight concrete used on project is not to exceed 0.05 percent after the 35 days of curing has elapsed.

1.03 REFERENCE STANDARDS

A. Refer to Section 01 42 19 – Reference Standards for information concerning availability and use of references.

ACI 318 - Building Code Requirements for Structural Concrete and Commentary

ASTM C33 - Standard Specification for Concrete Aggregates

ASTM C94 - Standard Specification for Ready-Mixed Concrete

ASTM C114 - Standard Test Methods for Chemical Analysis of Hydraulic Cement

ASTM C156 - Standard Test Method for Water Loss [from a Mortar Specimen] through Liquid Membrane-Forming Curing Compounds for Concrete

ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete

ASTM C227 - Standard Test Method for Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method)

B. All work under this section shall be in accordance with applicable provisions of CBC, Title 24, Part 2, Chapter 19A.

C. Refer to the following information for compliance of materials, products, and installation techniques: ASTM C33, C94, C150, C260, C494 and ACI 301, 304R-00 and 305R-99.

D. Handling and Placing: Concrete transported and placed as per ACI 318. Concrete shall be thoroughly compacted and worked into forms around reinforcing steel using suitable equipment. Vibrating of formwork will not be permitted.

E. Where conditions make placing difficult or reinforcing is congested, batches containing the same proportions of sand and cement used in the concrete plus a maximum of 50 percent of coarse aggregate shall be used.

F. Inspections: Notify the Architect, Structural Engineer, and the Division of the State Architect (DSA) at least forty-eight hours in advance of the first pour of concrete and sufficiently in advance of subsequent pours, see 1704A, Title 24, Part 2, California Building Code and Chapter 7, Section 7-145, Title 24, Part 1, California Administrative Code.

G. Testing: The Inspector will take at least four cylinders of concrete from each day's run of 50 yards, or 2,000 sq. ft. of surface area for slabs, or fractional part thereof, per ACI 318. Field specimens of concrete taken and tested in accordance with CBC Standard. Label each cylinder with job name, date, number, result of slump test, and the point in the pour in the structure from which the sample was taken noted thereon. One cylinder shall be tested at seven days and two at 28 days. The fourth cylinder shall be stored for 56 days unless instructed otherwise. Core test to comply with ACI 318 if cylinder tests indicate deficiencies.

H. Embedded Items: Pipes and conduit in concrete, located, sized and if required, sleeved in accordance with the requirements of ACI 318. Bolts and anchorage devices embedded in concrete to fastened sills, tie-down columns and other structural and framing members to concrete installed and secured in place before concrete is placed.

1. Concrete shall be placed in a continuous operation between predetermined joint locations. Location of construction joints shall be as shown on the drawings or at locations approved by the Engineer and the Division of the State Architect.

2. Joints shall be straight, exactly horizontal or vertical and the surface of the concrete shall be level wherever a run is stopped. Reinforcement shall be extended through joints or dowels to develop the full strength of the reinforcement. Construction joints shall be per ACI 318.

1.04 TESTING

A. Provide free access to work. Provide laboratory design mix. No substitutions will be

accepted. Cement and aggregates shall be tested.

B. Cement: Test Portland cement in accordance with Sections 1913A.1, Title 24, Part 2, and Section 3.2, ACI 318.

C. Core Tests: Take and test composite construction cores in accordance with Section 1913A.4, Title 24, Part 2

D. Batch Plant Inspection: Provide in accordance with Section 1705A.3.2, Title 24, Part 2.

E. Placing Record: Keep records of placing in accordance with Section 1705A.3.6, Title 24, Part 2.

F. Cylinder Test: Provide in accordance with Section 1913A.4, Title 24, Part 2.

G. Slump Test: Provide in accordance with ASTM C143 for each set of test cylinders.

H. Placing Inspection: Provide in accordance with ACI 318.

I. Moisture Testing: All slabs to receive flooring materials other than ceramic tile shall be calcium chloride dome tested at least 54 days after placement. Readings exceeding requirements of flooring manufacturer (generally 3 lbs. per 1,000 s.f. per 24 hours) will require retesting prior to installation of flooring. Readings in excess of 5 lbs. per 1000 s,f, will require testing by Owner using petrographic analysis to determine water/cement ratio at time of placement.

1. All tests in areas where concrete was placed with a water/cement ratio in excess of .45 will be paid for by Owner, but may be back charged to Contractor.

J. Compaction Testing: Provide in accordance with ASTM D689.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cement: For site walls – Colton II - Provide ASTM C150 TYPE II/V conforming to requirements of 1903A.3, Title 24, Part 2. If aggregates contain reactive substances, reactive with cement alkalies they may not be used.

B. Aggregates:

1. Base and Aggregate base shall conform to the State of California, Department of Transportation (CALTRANS) Standard Specifications, Current Edition. All base, whether called out as aggregate base or base shall be in conformance with CALTRANS Section 26 for Class 2 Aggregate Base, 3/4-inch maximum. The maximum percentage of recycled material allowable shall not exceed 50% of the total volume of aggregate used.

2. Base and Aggregate Base shall be provided by a licensed commercial materials supplier. Certifications shall be submitted with each submittal. Use of on-site asphalt materials in aggregate base or base is strictly prohibited. The use of Crushed Miscellaneous Base is strictly prohibited.

3. Aggregates: ASTM C33, 1-inch maximum conforming to CBC, Title 24, Part 2, 1903A.4 Aggregates and ACI 318.

C. Curing Materials:

1. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per square yard, complying with AASHTO M182, Class 2.

2. Moisture-Retaining Cover: One of the following, complying with ASTM C171:

   a. Curing paper
   b. Polyethylene film
   c. Burlap Polyethylene-coated

3. Liquid Membrane-Forming Curing Compound: Liquid type non-wax membrane-forming curing compound complying with ASTM C309, Type I, Class B. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal/ product shall be compatible with finishes to be applied to concrete.

   a. Products: Subject to compliance with requirements, provide one of the following:

"2000 Kure 1315"	BASF Building Systems.
"Kurez W Vox"	Euclid Chemical Co.
"Sealtight 1100-Clear"	W.R. Meadows, Inc.

   b. Surface Treatment for Slabs Receiving Wood Flooring, Sheet Vinyl, or Resilient Flooring including Sheet vinyl and Vinyl Cementitious Tile, Carpet with a Vinyl, Rubber or Unitary Type Backing: Waterproof, Seal and Cure Application, CS 2000 by Creteseal (800) 278-4273, or equivalent, Floor Seal Technology, Inc. (800) 572-2344.

4. Warranty: 15 years Labor and Materials backed by a $1,000,000 Insurance Policy

   a. A trained applicator shall apply CS 2000, or a technician must be on site during the spraying applications for verification to receive the 15 year warranty on floor coverings.

   b. When a floor covering system is installed on a slab treated with the product according to manufacturer's instructions, the manufacturer shall warrant the floor covering system against delamination due to negative, ground originated moisture migration or moisture-born contaminates for a period of ten years from the date of original installation.

      The warranty shall cover labor and materials necessary to repair or replace the floor covering system if repair cannot be made.

5. After pouring, placing, bullfloating, final finishing, soft cutting, and the surface of the concrete has hardened sufficiently to sustain foot traffic, CS 2000 Sealer shall be applied.

6. Apply CS 2000 Concrete Sealer at the rate of 200 square feet per gallon coverage. If puddling or bird bathing occurs, lightly broom product evenly over the substrate.

7. Continue brooming the product evenly over the substrate until the CS 2000 product has penetrated into the concrete.

8. Provide one of the following, or other approved equal:

   Creteseal CS 2000.
   Ashford Formula

Kure N Harden – By BASF

D. Water: Provide clean water free from injurious substances, per Section 3.4, ACI 318.

E. Vapor Barrier: Provide Stego Industries, 15-MIL Specifications, comply with ASTM E 1745, Class A, requirements.

F. Admixtures: *(No Calcium Chloride)* Admixtures to be used in concrete shall be subject to prior approval by the IOR and the Division of the State Architect, CBC.

1. Water Reducing: Reduce water 5 percent minimum, increase 28-day compressive strength, decrease 21 day drying shrinkage, ASTM C494.

2. Provide one of the following, or other approved:

   BASF The Chemical Co. Pozzolith 300 R.

3. Acceleration or Retarding: ASTM C494.

4. Air Entraining: 4 percent minimum, 6 percent maximum air content by volume, ASTM C260.

5. Admixtures shall be in accordance with Title 24, Part 2, 1903A.6 and Section 3.6 ACI 318.

6. Concrete Sealer: Dayton Superior "Cure & Seal 309 J18", W.R. Meadows "VOCOMP®-25", or Sonneborn® Products "Kure-N-Seal W" as manufactured by BASF.

   a. For site walls use Sinak HLQ 125.
   b. 3000 psi concrete 3/8" – 1/2" aggregate.

7. Non-Slip Surface: Trowel finish aluminum oxide grains, at exterior stairs and where indicated on the Drawings.

8. Add shrinkage reducing agent, such as "Eclipse®" as manufactured by Grace Construction Products or Peramin® SRA as manufactured by Peramin.

2.02 COMPONENTS

A. Non-Shrink Grout: Premixed compound consisting of nonmetallic aggregate, cement, water reducing and plasticizing agents, capable of developing non-shrink characteristics in both the horizontal and vertical direction with minimum compressive strength of 4,800 p.s.i. in two (2) days, and 6,000 p.s.i. in twenty-eight (28) days.

1. Provide Embeco Grout as manufactured by BASF, or other approved by Five Star, Dayton Superior, or Sika.

B. Cement Grout and Drypack: Precision support grout shall be BASF Masterflow® 713 Grout as manufactured by Master Builders, Cleveland, Ohio consisting of a hydraulic cementitious system, specially graded and processed natural fine aggregate and additional technical components. Other products will only be acceptable providing written approval of the Engineer is obtained prior to bidding. Acceptance will be granted only upon satisfactory evidence proving that the substitute material meets the following requirements, conforming to CRD C-621 Corps of Engineers.

1. Free of gas producing or releasing agents.

2. Free of oxidizing catalysts.

3. Free of inorganic accelerators, including chlorides.

4. Drypack: Pre-mixed grout shall be used. Use only enough water to make a stiff mix consistency. Pre-mixed grout shall be used under base plates per manufacturer's recommendations, and packed solid under pressure treated mudsills, per Structural Details, so as to obtain a continuous bearing. Minimum compressive strength of 6000psi.

C. Joint Materials: Provide tooled joints or plastic control joints.

1. Construction Joints: Provide metal keyed dividers for cold joints, subject to review and approval by Architect.

2. Expansion Joint Fillers:

a. 1/2-inch asphalt impregnated fiber conforming to ASTM D545 Type 5, where slab abutts wall or other vertical elements.

b. Where joint will be finished with sealant, set expansion strip with a 1/2-inch-deep removable expansion strip cap.

D. Under Slab Vapor Barrier: 15 mil Stego Wrap, Fortifiber Building Systems, or W.R. Meadows, or equal, over 2" compacted sand. Refer to plans and Geotechnical Report for installation.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Certifications: Provide legible copies of the delivery tickets of each load of concrete with the following information:

1. Name and location of plant.
2. Serial number of ticket.
3. Date and truck number.

4. Name of contractor.
5. Name of project.
6. Type of class of concrete and how to be used.
7. Amount of concrete.
8. Time loaded, time of arriving and unloading at project site.
9. Water added at site and total water content.
10. Type, name and amount of admixtures.
11. Name and signature of person making slump tests.
12. Testing number of test cylinders.

3.02 PREPARATION FOR PLACEMENT

A. Remove foreign debris and matter which may have accumulated within forms, and close ports and openings left in formwork.

B. Thoroughly clean tools used in transportation, placing and consolidating concrete immediately after each pour.

C. Ensure that required inspections have taken place prior to pour.

3.03 APPLICATION

A. Mixes: The minimum concrete ultimate twenty-eight (28) day compressive strength to be per structural drawings and shall be controlled by the following method:

1. Designed Mix: Concrete mixes shall be based upon previously proven mixes and material tests made by a recognized testing agency. The design of such mixes shall be based on the ultimate strength of the concrete assumed in the design of the structure and shall take into consideration both the workability of the mix and the durability of the concrete. Refer to Sections 1903A.1 and ACI 318.

2. When strengths in excess of 3,000 pounds per square inch are required, or special aggregates not having a record of satisfactory performance are used, or admixtures are used to reduce the cement content, ACI 318, shall be used to determine the mix.

3. Where design criteria in Title 24, Part 2, chapter 19A and ACI 318 Section 5.2, provide for the use of a splitting tensile strength value of concrete as a modifier, laboratory tests shall be made in accordance with the CBC to establish the value of fct corresponding to the specified value of f'c.

4. Tensile-splitting tests of field concrete shall not be used as a basis for acceptance.

5. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement not less than 1 inch and not more than 4 inches.

6. The maximum water to cement ratio shall not exceed 0.5 (50%).

7. Project specific shrinkage test. Perform test using actual proposed mix with some aggregates used in the project. Limit 28-Day shrinkage to 0.045 percent.

B. Control Density Fill: Provide batch plant design mix of 4000 p.s.i., flowable concrete composed of 3000 lbs. aggregate, 45 gals water, 50 lbs. of cement and 400 lbs. of flyash. Adjust proportions for materials as necessary and submit to Architect, for information.

3.04 CONVEYING

A. Handle concrete from mixer to location of placing as rapidly as practical, avoiding separation or loss of ingredients and rehandling. Use carts, wheelbarrows, concrete pumps, conveyors or buggies to deliver concrete to location of placement.

B. Do not permit a free fall of more than 4 feet when placing concrete.

C. Use elephant trunk spouts for placing concrete in vertical elements. Space so that concrete does not exceed 4-foot flow horizontally.

3.05 PLACEMENT

A. In general, place concrete in accordance with ACI 301, and in the presence of the inspecting personnel required.

B. Ensure that anchors, seats, plates, and other items to be cast into concrete are placed, held securely, and will not cause hardship in placing concrete.

C. Maintain records of poured concrete. Record date, location, quantity, air temperatures, and test samples taken.

D. Ensure that reinforcement, inserts, embedded parts, and formed joints are not disturbed during concrete placement.

E. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent.

F. Pour concrete continuously between predetermined construction, control and expansion joints. Pour in a checkerboard pattern, unless otherwise directed.

G. Excessive honeycomb and embedded debris is not acceptable.

H. Conform to ACI 305R-10 when concreting in hot weather.

I. Install vapor barrier in widest widths possible, under interior slabs on grade. Place at center of 4 inches of sand (minimum of 2 inches of sand top and bottom) lapping joints at least 18 inches and sealing joints, taping pipe penetrations.

J. Screed slabs and concrete bases level to a tolerance of 1/8-inch in 10 feet. Vary slab thickness as required to maintain top of slab elevation as design. Maintain top of slab elevation within ± 3/8" of intended elevation. Continually survey top of concrete elevations during concrete pour.

K. Inspect concrete surfaces immediately upon removal of forms. Patch imperfections.

L. Modify or replace concrete not conforming to required lines, details, shapes and elevations. Do not patch, fill, touch-up, repair, or replace exposed architectural concrete except upon express direction of Architect.

M. Provide smooth rubbed finish on concrete surfaces to be left exposed such as concrete walls, columns, beams, and joists, except as otherwise indicated.

N. Beginning immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete. Moisture cure for seven (7) days minimum all interior slabs.

O. Drypack shall be packed solid under baseplates and thoroughly packed under pressure treated mudsills, per Structural Details, so as to obtain a continuous bearing.

3.06 CONSTRUCTION JOINTS

A. Provide construction joints in slabs in accordance with ACI 318.

1. For slabs-on-grade, place control joints at 15 feet maximum on center in each direction, unless shown otherwise on Drawings.

B. The surface of horizontal construction joints shall be cleaned and roughened by removing the entire surface and exposing clean aggregate solidly embedded in mortar matrix, in accordance with the following procedure:

The contact surface shall be thoroughly cleaned by chipping or sand-blasting the entire surface not earlier than 5 days after initial pour, or by an approved method that will assure equal bond, such as a thorough hose-washing of the surface not less than two or more than four hours after the concrete is placed (depending on setting time), wash water and chalk-like material being entirely cleaned from the surface.

In the event that the contact surface becomes coated with earth, sawdust, etc. after being cleaned, the entire surface so coated shall be re-cleaned.

A mix containing the same proportion of sand and cement used in the concrete, plus a maximum of 50 percent of the coarse aggregate, shall be placed on horizontal joints before proceeding with the regular specified mix. A delay at least until the concrete in columns and walls is no longer plastic must occur before casting or erecting beams, girders, or slabs supported thereon. Beams, girders, brackets, column capitals, and haunches shall be considered as part of the floor system, and shall be placed monolithically therewith.

3.07 FIELD QUALITY CONTROL

A. Testing: Comply with CBC, Title 24, Part 2, Section 1903A.

B. If compressive strength tests of cylinder specimens fail to show strengths assumed in design, take 4-inch diameter cores at representative locations throughout structure as designated by Inspector. Take cores in accordance with ASTM C42. The strength level of the concrete shall be considered satisfactory if the average strengths of the area or panel equals or exceed the specified strength at 28 days, with no individual strength test of such area or panel less than 5 percent below that specified. Concrete that does not meet or exceed these criteria shall be removed by the contractor and replaced with concrete that conforms to these criteria. Remove and replace defective concrete at no additional cost to Owner. Be financially responsible for repair and replacement of other in-place materials affected by such removal and replacement.

Costs of taking core samples and performing tests required will be paid by Owner if tests prove satisfactory. If test fail to show required strengths, concrete contractor will be held financially responsible.

C. If the strength of the molded test cylinder falls below the minimum ultimate compressive strength assumed in the design, adjust the proportions of the mix for the remaining portion of the structure to give concrete of the assumed minimum strength.

D. Concrete will also be deemed defective which is not formed properly as indicated, is not true to intended alignment, is not plumb or level where so intended, is not true to intended grades, has sawdust or other debris embedded within it, or does not fully

conform to other provisions of these specifications. As directed, remove and replace with concrete complying with these specifications.

3.08 CONCRETE FINISHES

A. Slab Levels: Surfaces shall finish true to 1/8-inch in 10 feet on a straight-edge and in direction with maximum high and low variance occurring in not less than 20 feet and with 1/16-inch maximum tolerance in one running foot. Particular care shall be taken to finish troweling around the edges of the slabs so finish surface edges shall be at same elevations as the rest of the top surface of the slab. Slabs shall be surveyed continuously during pour.

B. Concrete Sealer: Concrete floors not indicated in the schedule to receive other finish shall receive two coats of sealer specified this section. Concrete to receive sealer shall be cured with specified concrete sealer that functions also as cure. Use the same material for each application.

C. Steel Trowel Finish: Interior slabs shall receive a monolithic steel trowel finish. Surfaces shall be screeded, wood floated, and steel-troweled. Finish shall be a smooth, hard, dense, impervious surface, free of defects. Finishers shall work from knee boards laid flat upon the surface. Mechanical troweling machines may be used if the desired finish and level tolerances can be obtained by their use, but finishing shall be by hand troweling.

1. Slabs to receive tile, carpet or adhered finishes shall receive light/medium broom finish to create "tooth" for adhesive.

D. Depressed slabs shall be finished by tamping slab with an open grid tamper, screeding with a straightedge and wood floating to a true and uniform surface, true to tolerance of 1/4-inches in 10 feet.

3.09 CONCRETE CURING AND PROTECTION

A. General: At slabs that do not receive concrete sealer, per 2.01D, provide the following: Concrete Curing per Section 5.11, ACI 318. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Concrete shall be maintained above 50 degrees and continuously moist for not less than 7 days.

Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

B. Slab Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover during, and by combinations thereof, as herein specified. Provide Moisture-Curing by the following Methods:

1. Keep concrete surface continuously wet by covering with water. Continuous water-fog spray, for seven (7) days minimum.

2. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof type of adhesive. Immediately repair holes or tears during curing period using cover material and waterproof tape, for seven (7) days minimum.

3. Provide Curing and Sealing Compound to exterior slabs, walks, and curbs, as follows:

   a. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Re-coat areas subjected to heavy rainfall within 3 hours after initial application.

   b. Maintain continuity of coating and repair damage during curing period.

   c. Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, such as liquid floor hardener, waterproofing, damp proofing, membrane roofing, ceramic or quarry tile, vinyl composition tile (VCT), glue-down carpet, painting, and other coatings and finish materials, unless otherwise acceptable to Architect.

   d. Cure formed concrete surfaces, including undersides of beams, supported slabs, and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

4. Curing Unformed Surfaces:

   a. Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of moisture curing method.

   b. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture-retaining cover, unless otherwise directed.

5. Sealer and Dustproofer: Apply two (2) coats of specified curing and sealing compound to Interior slab surfaces not receiving any other finish.

6. Concrete (other than high-early-strength) shall be maintained above 50 degrees F. and in a moist condition for at least the first seven (7) days after placement, except when cured in accordance with Section 5.11, ACI 318.

3.10 PROTECTION

A. Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

B. Exposed Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

1. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.

2. Grout base plates and foundations as indicated, using specified non-shrink grout. Use non-metallic grout for exposed conditions, unless otherwise indicated.

3. Steel Pan Stairs: Provide concrete fill for steel pan stair treads and landings and associated items. Cast-in safety inserts and accessories as shown on drawings. Screed, tamp, and finish concrete surfaces as scheduled.

C. Concrete Surface Repairs: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect.

1. Cut out honeycomb, rock pockets, voids over 1/4 inch in dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.

2. For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match color surrounding. provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

D. Repair of Formed Surfaces:

1. Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets; fins and other projections on surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.

2. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.

E. Repair of Unformed Surfaces:

1. Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness using a template having required slope.

2. Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01-inch wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets, and other objectionable conditions.

3. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.

4. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Architect.

5. Site walls: Remove cracked, honeycombed or defective concrete as required by the Architect from joint to joint. Patching, calking, filling or repairing will not be

permitted.

F. Repair Defective Areas:

1. Repair defective areas, except random cracks and single holes not exceeding 1-inch diameter, by cutting-out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4-inch clearance around.

2. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

3. Repair isolated random cracks and single holes not over 1 inch in diameter by dry-pack method. Groove top of cracks and cut-out holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part Portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry pack after bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.

4. Site walls: Remove cracked, honeycombed or defective concrete as required by the Architect from joint to joint. Patching, calking, filling or repairing will not be permitted

5. Perform structural repairs with prior approval of Architect of Structural Engineer for method and procedure, using specified epoxy adhesive and pressure grouting.

6. Repair method not specified above may be used, subject to acceptance of Architect.

G. Mitigation of Unacceptable High Moisture Emission Levels: Interior slabs-on-grade tested at levels in excess of 5.0 lbs/1000 s.f. shall be further evaluated with additional calcium chloride tests. Once levels are established, additional preparation measures shall be employed (depending on the magnitude of moisture levels) using one or both of the following products:

2 coats of Super-Krete
2 coats of Rust-Oleum 6000 system

END OF SECTION

05 00 00

METALS

SANTEE SCHOOL DISTRICT

SECTION 05 50 00

METAL FABRICATIONS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes: Completion of miscellaneous metal fabrications such as angles, plates, sheet goods, castings, railings, nosings, ladders, and stairs as indicated on the drawings and specified herein.

B. Substrates to which fabrications are to be attached or embedded.

C. Related Sections:

1. Finish painting: see Section 09 90 00.

1.02 REFERENCE STANDARDS

A. In addition to mandatory compliance with governing bodies and codes having jurisdiction over the project, provide materials complying with the following standards and industry recommendations: ASTM A36, A47, A48, A53, A108, A283, A307, A312, A314, A325, A475, A500, A554, A653, A743, A1008 A1011, B108, B209, B221, SSPC, NAAMM, AND AA.

B. Materials shall conform to CBC, Title 24, Part 2, Chapter 22A.

1.03 SUBMITTALS

A. Submit fabrication shop drawings on items to be provided.

B. Where other than mill finishes are specified, provide samples of required finish which will be reviewed for color, texture, style, and finish.

C. Submit mill test reports and chemical analyses of materials bearing heat numbers not required to be tested, in accordance with other sections of these specifications.

D. Submit testing results in accordance with other sections of these specifications.

1. Provide one tensile, and elongation test, and one bend or flattening test for each five tons or fraction, of each shape and size, for unidentified material.

2. The Owner reserves the right to reject materials, installed or not, which exhibit defects or do not pass inspections or tests.

E. Scrap collection and recycling plan: Contractor shall prepare and submit a scrap collection and recycling plan for all miscellaneous and structural steel.

1.04 SOURCE QUALITY CONTROL

A. Inspection and Testing:

1. Testing for steel, welding and fabrication shall be in accordance with California Building Code (CBC), Title 24, Part 2, Section 1705A.2.

2. Welding inspection shall be in accordance with Title 24, Part 2, Section 1705A.2.

3. Shop Welding: Ensure that shop welding is performed in an approved, licensed shop. Continuous inspection shall be required as noted in Table 1705A.2.

4. Field Welding: Stress-carrying welds are to be inspected by a qualified welding inspector. Inspections will be paid for by Owner.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Structural steel shall comply with ASTM A6 and requirements of Title 24, Part 2, Chapter 22A.

B. Steel Plates, Shapes and Bars: ASTM A36.

C. Steel Plates to be Bent or Cold-Formed: ASTM A283, Grade C.

D. Steel Bars and Bar-Sized Shapes: ASTM A36.

E. Steel Tubing (Cold-Formed, Welded or Seamless): ASTM A500, Grade B.

F. Cold-Finished Steel Bars: ASTM A108, grade selected by fabricator.

G. Cold-Rolled Carbon Steel Sheets: ASTM A1011.

H. Galvanized Carbon Steel Sheets: ASTM A653, G90 zinc coating.

I. Gray Iron Castings: ASTM A48, Class 30.

J. Malleable Iron Castings: ASTM A47, grade as selected.

K. Steel Pipe: ASTM A53, type as selected, Grade B, black finish, standard weight Schedule 40.

L. Steel Wire Rope: ASTM A475, zinc coated steel wire strand, size and number of wires required, common grade with Class B zinc coating.

M. Expanded Aluminum Grating: ASTM B209, alloy 5052.

N. Aluminum Extrusions: ASTM B221, alloy 6063-T5 except alloy 6063-T6 for pipe.

O. Aluminum Sheet or Plate: ASTM B209, alloy 6061-T6, mill finish.

P. Aluminum Castings: ASTM B108, alloy 214.

Q. Stainless Steel Castings: ASTM A743, CF8 or CF20.

R. Stainless Steel Pipe: ASTM A312.

S. Stainless Steel Tube: ASTM A554, Type 302/304.

T. Stainless Steel Bars: ASTM A314, Type 302/304.
U. Shop Primer: Tnemec Series 10, or other approved.

V. Field Galvanizing: Provide ZRC, or other approved.

W. Arc Welding Electrodes: ASTM A743.

X. Bolts and Nuts: ASTM A307

2.02 FABRICATION

A. Verify actual field dimensions prior to fabrication.

B. Fabricate items with joints neatly fitted and properly secured.

C. Fit and shop assemble in largest practical sections for delivery to site.

D. Welding shall comply with CBC Title 24, Part 2, Section 1705A.2. Employ certified welders in accordance with AWS D1.1 and D1.3. Grind exposed welds smooth and flush with adjacent finished surfaces. Defective welds must be cut out and replaced per AWS D1.1.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts unobtrusively located, consistent with design of structure, except where specifically noted otherwise.

F. Make exposed joints flush butt type hair-line joints where mechanically fastened.

G. Supply components required for proper anchorage of metal fabrications. Fabricate anchorage and related components of same material and finish as metal fabrication, unless otherwise specified or shown.

H. Thoroughly clean surfaces of rust, scale, grease and foreign matter prior to prime painting and galvanizing.

I. Galvanize all exterior miscellaneous ferrous metal fabrications. Prime and paint, where directed in other specifications or in plans. Do not shop prime surfaces in direct contact with concrete or other cementitious materials or requiring field welding. Shop prime in two coats. Provide minimum G90 galvanized coating where galvanizing is required. In locations where field welding has been completed, zinc coat all surfaces prior to priming and painting.

2.03 MANUFACTURED UNITS

A. 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 ½" 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 for more than 20% of their length. Where provided, horizontal projections shall occur 1 ½" 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 ¼" minimum and 2" maximum.

5. Handrail gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive elements and shall have rounded edges.

6. Handrails shall not rotate within their fittings.

7. 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.

8. The orientation of at least one handrail shall be in the direction of the stair run, perpendicular to the direction of the stair nosing, and shall not reduce the minimum required width of the stair. **CBC Section 22B-505.2.1**

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**

B. Galvanized Railings for Stairs and Ramps: Provide nominal diameter extra strong steel, galvanized 1-1/4" inch diameter with actual 1.66" inch outside diameter unless otherwise noted per American Institute of Steel Construction. (Wall handrail and guardrail mounted 1-1/2" clear from side walls.)

1. 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.

2. Handrail brackets shall mount to the bottom of the handrail. The vertical arm of the bracket shall provide a minimum 1-1/2 inches (38 mm) clearance from the top surface of the horizontal surface of the bracket that attaches to the wall.

3. 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.

4. 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.

5. 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 surface.

6. Handrail gripping surfaces with a circular cross section shall have an outside diameter of 1-1/4" minimum and 2" maximum.

7. 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.

8. Handrail gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive elements and have rounded edges.

9. Handrails shall not rotate within their fittings.

10. 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 or ramps.

11. A 2" minimum high curb or barrier shall be provided to prevent the passage of a 4" diameter sphere rolling off the sides of a ramp surface. Such a curb or barrier shall be continuous and uninterrupted along the length of the ramp, per **CBC Section 11B-405.9.2**.

C. Equipment Support System: Provide Unistrut, or other approved.

1. Main Runner: P5500 channel at 8-foot centers.
2. 1/2-inch hanging rods at 48 inches on centers and hanger clamps.
3. Cross Runner: P3000 channel at 4-foot centers.
4. P3047 "U" shaped fittings.
5. Provide and size pipe clamps as required.
6. Provide hardware and accessories as required.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Surface Conditions: Inspect surfaces and work in place by others and verify that such work is in a condition appropriate to receive work of this section. Do not apply or install work of this section until unsatisfactory work of others is in a condition which will ensure the correct installation of materials and products of this section.

3.02 INSTALLATION

A. Obtain approval of Architect prior to site cutting or making adjustments which are not part of intended work or are not shown on shop drawings.

B. Install items square and level, accurately fitted and free from distortion and defects.

C. Make provisions for erection stresses by temporary bracing. Keep work in alignment.

D. Replace items damaged during installation.

E. Perform field welding in accordance with AWS D1.1.

F. After installation, touch-up field welds and scratched and damaged paint, or coated surfaces. Use primer and paint consistent with shop finish.

G. Supply and assist with setting items requiring to be cast into concrete, or embedded in masonry, complete with necessary setting templates.

H. Stairs:

1. Ensure that stair stringer supports are square or rectangular steel tubing or steel channels.

2. Unless shown otherwise, treads are to be pan type, with galvanized coating.

3. Where required, provide support sleeves for handrails.
4. Provide adequate strength and stiffness to limit deflection on every stair tread and landing such that when a 300-pound person places entire weight on stair tread or landing, deflection is limited to 1/8-inch maximum at point.

5. Prime paint surfaces of stair assembly after fabrication, and grind smooth welds as specified.

6. Secure handrails to stair and steel supports where shown, at top or bottom with screws or welds, and achieve a lateral resistance as required by California Building Code (CBC).

3.03 CLEANING

A. Clean site after work of this section.

B. Remove weld splatters.

C. Use galvanizing repair coating specified, then re-prime areas of materials damaged during installation and other construction activities and leave in condition for subsequent finish painting or application of additional finish materials provided by others.

END OF SECTION

07 00 00

THERMAL AND MOISTURE PROTECTION

SANTEE SCHOOL DISTRICT

SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes joint sealants for the applications indicated in the Joint-Sealant Schedule at the end of Part 3.

B. Related Sections include the following:

1. Division 1 Section "LEED Requirements" for additional LEED requirements
2. Division 9 Section "Gypsum Board Assemblies" for sealing perimeter joints of gypsum board partitions to reduce sound transmission.

1.03 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

1.04 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. LEED Submittals:
1. Credits MR 4.1 and 4.2: Product Data indicating percentages by weight of postconsumer and preconsumer recycled content.
   a. Include statement indicating costs for each product having recycled content.
2. Credit EQ 4.1: Manufacturers' product data for installation sealants, including printed statement of VOC content.

1.05 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.06 PROJECT CONDITIONS

B. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

2.02 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Provide interior sealants and sealant primers that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.

C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.03 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

C. Single-Component Neutral- and Basic-Curing Silicone Sealant:

1. Products:

a. GE Silicones; SilPruf LM SCS2700.
b. Tremco; Spectrem 1 (Basic).
c. GE Silicones; SilPruf SCS2000.
d. Sonneborn, Division of ChemRex Inc.; Omniseal.
e. Tremco; Spectrem 3.
f. Tremco; Spectrem 2

2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 50.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
6. Stain-Test-Response Characteristics: Nonstaining to porous substrates per ASTM C 1248.

D. Single-Component Mildew-Resistant Neutral-Curing Silicone Sealant:

1. Products:

a. Pecora Corporation; 898.
b. Tremco; Tremsil 600 White.

2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: To sensitive surface joint substrates indicated, O.

a. Use O Joint Substrates: Galvanized steel and insulated glazing units.

E. Single-Component Mildew-Resistant Acid-Curing Silicone Sealant:

1. Products:

a. Dow Corning Corporation; 786 Mildew Resistant.
b. GE Silicones; Sanitary SCS1700.
c. Tremco; Tremsil 200.

2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: G, A, and, as applicable to joint substrates indicated, O.

2.04 URETHANE SEALANT

A. Multicomponent Pourable Urethane Sealant:

1. Products:

a. Pecora Corporation; Urexpan NR-200.
b. Schnee-Morehead, Inc.; Permathane SM 7201.
c. Tremco; THC-901.
d. Tremco; THC-900.

2. Type and Grade: M (multicomponent) and P (pourable).
3. Class: 25.
4. Use Related to Exposure: T (traffic).
5. Uses Related to Joint Substrates: M, A, and, as applicable to joint substrates indicated, O.

B. Single-Component Nonsag Urethane Sealant:

1. Products:

a. Sika Corporation, Inc.; Sikaflex - 1a.
b. Sonneborn, Division of ChemRex Inc.; NP 1.
c. Tremco; Vulkem 116.
d. Tremco; DyMonic 100

2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Uses Related to Exposure: T (traffic) and NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

2.05 LATEX JOINT SEALANTS

A. Latex Sealant: Comply with ASTM C 834, Type P, Grade NF.

B. Products:
1. Pecora Corporation; AC-20+.
2. Schnee-Morehead, Inc.; SM 8200.
3. Sonneborn, Division of ChemRex Inc.; Sonolac.
4. Tremco; Tremflex 834.

2.06 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or

joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.07 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include, but are not limited to, the following:

    a. Concrete.
    b. Masonry.
    c. Unglazed surfaces of ceramic tile.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include, but are not limited to, the following:

a. Metal.
b. Glass.
c. Porcelain enamel.
d. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.03 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

D. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

F. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

G. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.

2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

3.04 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.05 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.06 SEALANT SCHEDULE

JOINT SEALANT	APPLICATION
Single and Multi-Component Neutral- and Basic-Curing Silicone Sealant	• Exterior perimeter joints at frames of doors, windows and louvers • Exterior control and expansion joints in ceilings and other overhead surfaces • Exterior vertical joints between different materials listed above • All other exterior vertical and horizontal nontraffic joints unless noted otherwise
Single-Component Mildew-Resistant Neutral-Curing Silicone Sealant	• Exterior joints with galvanized steel or insulated glass substrates
Single-Component Mildew-Resistant Acid-Curing Silicone Sealant	• Interior joints between plumbing fixtures and adjoining walls, floors, and counters • Joints between counters and adjoining walls and floors at bathrooms, kitchens and other wet areas
Multicomponent Pourable Urethane Sealant	• Exterior horizontal nontraffic and traffic isolation and contraction joints in cast-in-place concrete slabs
Single-Component Nonsag Urethane Sealant	• Interior perimeter joints of exterior openings
Latex Sealant	• Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances

END OF SECTION

08 00 00

OPENINGS

SANTEE SCHOOL DISTRICT

SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes:

1. Interior standard steel doors and frames.
2. Exterior standard steel doors and frames.
3. Borrowed lites.
4. Hollow-metal panels.

B. Related Requirements:
1. Section 08 71 00 "Door Hardware" for door hardware for hollow-metal doors.
2. Section 09 90 00 "Painting and Coatings" for field painting of doors and frames.

1.03 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.04 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

B. Coordinate requirements for installation of door hardware, and access control and security systems.

C. Existing Conditions: Field survey existing doors and frames that are part of the Work. For existing doors and frames to remain and to receive new door hardware, determine compatibility with hardware specified in Section 08 71 00 "Door Hardware." For existing door openings to receive a new door and/or frame, verify dimensions of door opening and frame depth.

1. Submit a list of respective door and frame measurements to the District Construction Manager for review prior to ordering doors and frames.
2. Notify the District Construction Manager of any doors and/or frames found to be unsuitable for reuse, or that will not accept specified door hardware.

1.05 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.06 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, core descriptions, and finishes.

B. Shop Drawings: Include the following:

1. Elevations of each door type.
2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
7. Details of anchorages, joints, field splices, and connections.
8. Details of accessories.
9. Details of moldings, removable stops, and glazing.

C. Samples for Verification:

1. Fabrication: Prepare Samples approximately 12 by 12 inches to demonstrate compliance with requirements for quality of materials and construction:

a. Doors: Show vertical-edge, top, and bottom construction; core construction; and hinge and other applied hardware reinforcement. Include separate section showing glazing if applicable.
b. Frames: Show profile, corner joint, floor and wall anchors, and silencers. Include separate section showing fixed hollow-metal panels and glazing if applicable.

D. Product Schedule: For hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

1.07 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.

B. Certification of Label Construction: For labeled doors, certificate from nationally recognized testing agency stating that component construction conforms to UL rating requirements for the label indicated.

C. Certification of Rated Assembly: For rated assemblies, provide certificate from nationally recognized testing agency that doors provided have been tested for use in assemblies

complying with NFPA 80 for fire-protection ratings indicated, based on testing at positive pressure according to UL 10C.

D. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.

E. Certification of Physical Endurance: For hollow metal doors, certificate from nationally recognized testing agency that doors comply with requirements of SDI 131-10.

F. Qualification Data: For Manufacturer, Supplier, and Installer.

1.08 QUALITY ASSURANCE

A. Manufacturer Qualifications: A member of SDI that supplies doors and frames through a national distribution system. Manufacturers that market materials by a factory direct method are not acceptable.

B. Supplier Qualifications: Supplier shall be a qualified direct distributor of the manufacturer's products. The Supplier shall have in its regular employment a person who is currently certified by DHI as an Architectural Hardware Consultant (AHC) or a Certified Door Consultant (CDC). The Supplier shall be available at reasonable times throughout the Project for consultation with Contractor, Architect, and District Construction Manager. The Supplier shall be available for in-person on-site consultation within 48 hours of first notice.

C. Installer Qualifications: Firm with a minimum of five years' experience in the installation of hollow metal doors and frames similar to the type required for this Project.

D. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

E. The District Construction Manager may select not more than two doors at random for dismantling and inspection of internal construction for compliance with Project Specifications. Provide doors, labor, and tools for inspection under the District Construction Manager's supervision, at Contractor's expense.

F. Failure of any hollow metal frame or door to comply with specified requirements shall be grounds to reject the entire shipment of hollow metal doors and frames, as well as to reject the Manufacturer. Items shall be replaced at Contractor's expense, including two additional doors for dismantling and inspection. No extensions of time or additions to the Contract amount will be allowed due to a rejection of material and substitution of the hollow metal Manufacturer.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use unvented plastic.

B. Upon delivery to the site, inspect hollow-metal work for damage. Minor damage may be repaired provided refinished items are equal to new work and accepted by the District Construction Manager. Otherwise, remove and replace damaged items.

C. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

D. Store hollow-metal work vertically under cover in a dry, secure location at Project site with head up. Place on minimum 4-inch-high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation. If cardboard containers become wet, remove containers and dry contents immediately.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to warrant products against defects in materials and workmanship.

1. Warranty Period: One year from date of delivery.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Ceco Door; ASSA ABLOY.
2. Curries Company; ASSA ABLOY.
3. Steelcraft; an Allegion brand.
4. Or Equal.

2.02 PERFORMANCE REQUIREMENTS

A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

1. Smoke- and Draft-Control Assemblies: Provide assemblies with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

B. Fire-Rated, Borrowed-Lite Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

2.03 INTERIOR STANDARD STEEL DOORS AND FRAMES

A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3.

1. Physical Performance: SDI A250.4, Level A.
2. Doors:

    a. Type: As indicated in the Door and Frame Schedule.
    b. Thickness: 1-3/4 inches.
    c. Face: Metallic-coated, cold-rolled steel sheet, minimum thickness of 0.053 inch, with minimum A60 coating.
    d. Edge Construction: Model 2, Seamless construction by continuous wire weld.
    e. Core: Polystyrene.

3. Frames:

    a. Materials: Metallic-coated, steel sheet, minimum thickness of 0.053 inch, with minimum A60 coating.
    b. Construction: Full profile welded
        1) Welded frames shall be ground smooth flush with neatly mitered or butted material cuts. Re-prime welded areas.

4. Exposed Finish: Prime.

2.04 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Extra-Heavy-Duty Doors: SDI A250.8, Level 3.

1. Physical Performance: SDI A250.4, Level A.
2. Type: As indicated in the Door and Frame Schedule.
3. Thickness: 1-3/4 inches
4. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A60 coating.
5. Edge Construction: Model 2, Seamless construction by continuous wire weld.
6. Core: Polystyrene.
7. Exposed Finish: Prime.

C. Maximum-Duty Frames:

1. Physical Performance: SDI A250.4, Level A.
2. Materials: Metallic-coated steel sheet, minimum thickness of 0.067 inch, with minimum A60 coating.
3. Construction: Full profile welded. Welded frames shall be ground smooth flush with neatly mitered or butted material cuts. Re-prime welded areas.
4. Exposed Finish: Prime.

2.05 BORROWED LITES AND HOLLOW-METAL PANELS

A. Provide hollow-metal panels of same materials, construction, and finish as adjacent door assemblies.

2.06 FRAME ANCHORS

A. Jamb Anchors:

1. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet.

2. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042-inch-thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.188 inch thick.

3. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.

4. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.

5. Post installed Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch-diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor. Formed from same material as frames, minimum thickness of 0.051 inch. Provide 2 fasteners welded to the bottom of each jamb and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
2. Floor Anchors for Concrete Slabs with Underlayment: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at top of underlayment.

2.07 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.

D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Zcoating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

F. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

G. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.

H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

I. Glazing: Comply with requirements in Section 08 80 00 "Glazing."

J. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.08 FABRICATION

A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Hollow-Metal Doors:

1. Vertical Edges for Single-Acting Doors: Bevel edges 1/8 inch in 2 inches. Both hinge edge and lock edge channels to be welded to each face sheet of door.

   a. Door lock edge reinforcing shall be one-piece, full height 14 gage channel.
   b. Door hinge edge reinforcing shall be one-piece full height 12 gage channel formed and tapped for hinges, or as required per hardware.

2. Top Edge Closures: Close top edges of doors with flush closures of 16 gage steel welded to face sheets.

3. Bottom Edge Closures: Close bottom edges of doors where required for attachment of weather stripping with end closures or channels of 16 gage steel welded to face sheets.

4. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration. Close tops of exterior doors flush by the addition of 16 gage galvanized steel channel fillers sealed watertight.

5. Astragals: Provide flat security type or 'Z' overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.

C. Hollow-Metal Frames: Fabricate in one piece unless shipping or handling limitations dictate fabrication in sections. Where frames are fabricated in sections, minimize sections, and provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

1. Welded frame units are to be delivered to job site as single units. Transoms, sidelights, and window walls which are oversized for transportation, shall be furnished with splices and assembled in the field.
2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated. Screws are allowed only on the non-secure side and shall not be visible when viewing door lite frame face.
3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be built into masonry or grouted in full.
4. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
5. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Masonry Type: Locate anchors not more than 16 inches from top and bottom of frame. Space anchors not more than 32 inches o.c., to match coursing, and as follows:

        1) Two anchors per jamb up to 60 inches high.
        2) Three anchors per jamb from 60 to 90 inches high.
        3) Four anchors per jamb from 90 to 120 inches high.
        4) Four anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

    b. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 24 inches o.c. and as follows:

        1) Three anchors per jamb up to 60 inches high.
        2) Four anchors per jamb from 60 to 90 inches high.
        3) Five anchors per jamb from 90 to 96 inches high.
        4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.

    c. Compression Type: Not less than two anchors in each frame.

    d. Post installed Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.

6. Head Anchors: Two anchors per head for frames installed in metal-stud walls, and three or more anchors in frame widths exceeding 42 inches. Spot weld to each jamb and extend to structure where indicated on Drawings.
7. Head Struts: For frames not anchored to masonry or concrete construction, provide ceiling struts spot welded to jambs each side extending to building structure where indicated on Drawings.
8. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.

    a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
    b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

9. Terminated Stops: Terminate stops 6 above finish floor with a 90-degree angle cut, and close open end of stop with steel sheet closure. Cover opening in

extension of frame with welded-steel filler plate, with welds ground smooth and flush with frame.

D. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.

E. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
2. Comply with BHMA A156.115 for preparation of hollow-metal work for hardware. Provide minimum thickness hardware reinforcing for mortise or surface applied hardware as follows:

a.	Hinge doors.	0.138 inch or equivalent number of threads on
b.	Hinge	0.180 inch on frames for mortise hinges.
c.	Continuous hinges	0.108 inch full length.
d.	Locks	0.108 inch or equivalent number of threads.
e.	Panic Devices	0.108 inch.
f.	Surface Closer	0.078 inch.
g.	Hold Open Arm	0.108 inch.
h.	Closer	0.078 inch channel type.

3. Through-bolts (SNB) are not permitted.
4. Do not include unnecessary cutouts in door faces not required by hardware template.

F. Glazed Lites: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted or mitered hairline joints.

1. Window frame glass stops shall be a minimum 0.0516-inch steel and 5/8 inch in height. Exterior stops and countersunk flat-head screws to be galvanized.
2. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
3. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
4. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
5. Provide loose stops and moldings on inside of hollow-metal work.
6. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

G. Existing Construction:

1. Modify existing doors and frames indicated to receive new hardware and hardware reinforcements.
2. Template existing frames indicated to receive new doors with lockset latchbolt aligned with existing frame strike.
3. When new strikes are required in frames with inadequate dimensions, field cut existing strike jambs, remove the existing strikes, and weld strike reinforcement as required. Surface installation is prohibited.

4. Fill, patch, sand, and repaint doors and frames as required by the removal of existing hardware and the installation of replacement hardware.
5. Furnish fillers as required after removal of existing hardware.

2.09 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2.10 ACCESSORIES

A. Louvers: Provide insert type louvers for interior doors, where indicated, which comply with SDI 111, with blades or baffles formed of 0.040-inch-thick, cold-rolled steel sheet set into 0.040-inch-thick steel frame. Louvers and frames to be prime coated.

1. Sightproof Louver: Stationary louvers constructed with inverted-V or inverted-Y blades.
2. Lightproof Louver: Stationary louvers constructed with baffles to prevent light from passing from one side to the other.
3. Fire-Rated Automatic Louvers: Louvers constructed with movable blades closed by actuating fusible link, and listed and labeled for use in fire-rated door assemblies of type and fire-resistance rating indicated by same qualified testing and inspecting agency that established fire-resistance rating of door assembly.

B. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

C. Grout Guards: Formed from same material as frames, not less than 0.016 inch thick.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.03 INSTALLATION

A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.

B. Hollow-Metal Frames: Comply with [**SDI A250.11**] [**NAAMM-HMMA 840**].

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and without damage to completed Work.

    a. At fire-rated openings, install frames according to NFPA 80.
    b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    c. Install frames with removable stops located on secure side of opening.
    d. Install door silencers in frames before grouting.
    e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    f. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
3. Solidly pack mineral-fiber insulation inside frames.
4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
5. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
6. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
7. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:

    a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below.

1. Install hollow metal doors in frames using hardware specified in Section 08 71 00 "Door Hardware". Install securely without marking or defacing hardware or finish work. Protect hardware finishes with suitable protective covering until completion of building.
2. Doors are to be expertly hung and shall fit snug against all stops. After hanging, make all adjustments and remove respective hardware for finish painting where required. Reinstall hardware after finish painting.
3. Non-Fire-Rated Steel Doors:

    a. Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch.
    b. Between Edges of Pairs of Doors: 1/8 inch to 1/4 inch plus or minus 1/32 inch.
    c. At Bottom of Door without Thresholds: 5/8 inch plus or minus 1/32 inch.
    d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.

4. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
5. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.

D. Glazing: Comply with installation requirements in Section 08 80 00 "Glazing" and with hollow-metal manufacturer's written instructions.

1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

3.04 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

B. Remove dirt, grout, excess sealant, glazing compounds, mortar and other bonding material from hollow-metal work immediately after installation. Fill all dents and holes with metal filler and sand smooth and flush with adjacent surfaces. Reprime and paint to match finish. Clean and polish.

C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

E. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Door Hardware.

B. Related Sections:

1. Section 07 92 00 – Joint Sealants: Exterior thresholds
2. Section 08 11 13 – Hollow Metal Doors and Frames.

C. Specific Omissions: Hardware for the following is specified or indicated elsewhere.

1. Windows.
2. Cabinets, including open wall shelving and locks.
3. Signs, except where scheduled.
4. Toilet accessories, including grab bars.
5. Installation.
6. Rough hardware.
7. Conduit, junction boxes & wiring.

1.02 REFERENCES:

Use date of standard in effect as of Bid date.

A. American National Standards Institute – ANSI/BHMA 156.18 – Materials and Finishes.

B. ADA – Americans with Disabilities Act of 1990 as amended by the ADA Amendments Act of 2010.

C. BHMA – Builders Hardware Manufacturers Association

D. DHI – Door and Hardware Institute

E. NFPA – National Fire Protection Association

1. NFPA 80 – Fire Doors and Other Opening Protectives
2. NFPA 105 – Smoke Door Assemblies and Other Opening Protectives
3. NFPA 252 – Fire Tests of Door Assemblies

F. UL – Underwriters Laboratories

1. UL10C – Positive Pressure Fire Tests of Door Assemblies.
2. UL 305 – Panic Hardware

G. WH – Warnock Hersey

H. 2019 California Building Code

I. SDI – Steel Door Institute

J. WI – Woodwork Institute

K. AWI – Architectural Woodwork Institute

L. NAAMM – National Association of Architectural Metal Manufacturers

1.03 SUBMITTALS & SUBSTITUTIONS

A. SUBMITTALS: Submit six copies of schedule per Section 01 33 00. Only submittals printed one sided will be accepted and reviewed. Organize vertically formatted schedule into "Hardware Sets" with index of doors and headings, indicating complete designations of every item required for each door or opening. Include following information:

1. Type, style, function, size, quantity and finish of hardware items.

2. Use BHMA Finish codes per ANSI/BHMA A156.18.

3. Name, part number and manufacturer of each item.

4. Fastenings and other pertinent information.

5. Location of hardware set coordinated with floor plans and door schedule.

6. Explanation of abbreviations, symbols, and codes contained in schedule.

7. Mounting locations for hardware.

8. Door and frame sizes, materials and degrees of swing.

9. List of manufacturers used and their nearest representative with address and phone number.

10. Catalog cuts.

11. Wiring and Riser Diagrams.

12. Manufacturer's technical data and installation instructions for electric hardware.

13. Date of jobsite visit for renovation projects.

B. Bid and submit manufacturer's updated/improved item if scheduled item is discontinued.

C. Deviations: Highlight, encircle or otherwise identify deviations from "Schedule of Finish Hardware" on submittal with notations clearly designating those portions as deviating from this section.

D. If discrepancy between drawings and scheduled material in this section, bid the more expensive of the two choices, note the discrepancy in the submittal and request direction from Architect for resolution.

E. Substitutions per Division 1 – General Requirements, Specification Sections. Include product data and indicate benefit to the Project. Furnish operating samples on request.

F. Items listed with no substitute manufacturers have been requested by Owner to meet existing standard.

G. Furnish as-built/as-installed schedule with closeout documents, including keying schedule, wiring diagrams, manufacturers' installation, adjustment and maintenance information, and supplier's final inspection report.

1.04 QUALITY ASSURANCE:

A. Qualifications:

1. Hardware supplier: direct factory contract supplier who employs a certified architectural hardware consultant (AHC), available at reasonable times during course of work for project hardware consultation to Owner, Architect and Contractor.

a) Responsible for detailing, scheduling and ordering of finish hardware. Detailing implies that the submitted schedule of hardware is correct and complete for the intended function and performance of the openings.

B. Hardware: Free of defects, blemishes and excessive play. Obtain each kind of hardware (latch and locksets, exit devices, hinges and closers) from one manufacturer.

C. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.

D. Exterior Classroom Exit Doors: Use classroom security function locksets with holdback feature.

E. Fire-Rated Openings: NFPA 80 compliant. Hardware UL10C / California State Fire Marshal Standard 12-7-4 (positive pressure) compliant for given type/size opening and degree of label. Provide proper latching hardware, non-flaming door closers, approved-bearing hinges, and resilient seals. Coordinate with wood door section for required intumescent seals. Furnish openings complete.

F. Note: scheduled resilient seals may exceed selected door manufacturer's requirements.

G. See 2.6.G for added information regarding resilient and intumescent seals.

H. Furnish hardware items required to complete the work in accordance with specified performance level and design intent, complying with manufacturers' instructions.

I. Pre-Installation Meetings: Initiate and conduct with supplier, installer and related trades, coordinate materials and techniques, and sequence complex hardware items and systems installation. Include manufacturers' representatives of locks, panic hardware and door closers in the meetings. Convene prior to commencement of related work.

1.05 DELIVERY, STORAGE AND HANDLING:

A. Delivery: coordinate delivery to appropriate locations (shop or field).

1. Permanent keys and cores: secured delivery direct to District locksmith.

B. Acceptance at Site: Items individually packaged in manufacturers' original containers, complete with proper fasteners and related pieces. Clearly mark packages to indicate contents, locations in hardware schedule and door numbers.

C. Storage: Provide securely locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, dust, excessive heat and cold, etc.

1.06 PROJECT CONDITIONS AND COORDINATION:

A. Where exact types of hardware specified are not adaptable to finished shape or size of members requiring hardware, provide suitable types having as nearly as practical the same operation and quality as type specified, subject to Architect's approval.

B. Coordination: Coordinate hardware with other work. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents. Furnish related trades with the following information:

1. Location of embedded and attached items to concrete.

2. Location of wall-mounted hardware, including wall stops.

3. Location of finish floor materials and floor-mounted hardware.

4. Locations for conduit and raceways as needed for electrical hardware items. Fire/life-safety system interfacing. Point-to-point wiring diagrams plus riser diagrams to related trades.

5. Manufacturer templates to door and frame fabricators.

C. Check Shop Drawings for doors and entrances to confirm that adequate provisions will be made for proper hardware installation.

D. 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.

1. For renovation projects, submittals prepared without thorough jobsite visit by qualified hardware expert will be rejected as non-compliant.

1.07 WARRANTY:

A. Part of respective manufacturers' regular terms of sale. Provide manufacturers' written warranties:

1.	Locksets:	Five years
2.	Exit Devices:	Three years mechanical Two years electrical
3.	Closers:	Ten years mechanical Two years electrical
4.	Hinges:	Life of the Installation
5.	Continuous Hinges	Life of the Installation
6.	Other Hardware	Two years

1.08 COMMISSIONING:

A. Conduct these tests prior to request for certificate of substantial completion:

1. With installer present, test door hardware operation with climate control system and stairwell pressurization system both at rest and while in full operation.

2. With installer, access control contractor and electrical contractor present, test electrical hardware systems for satisfactory operation.

3. With installer and electrical contractor present, test hardware interfaced with fire/life-safety system for proper operation and release.

1.09 REGULATORY REQUIREMENTS:

A. All hardware for accessible doors shall meet the requirements of CBC Sections 1008.1.7, 1008.1.9, 11B-404, 11B-309.4 and 1008.1.8.

B. Hand-activated door opening hardware, handles, pulls, latches, locks, and other operating devices on accessible doors shall have a shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist to operate. CBC Section 11B-309.4. Hardware shall be within 34" and 44" above the floor. CBC Section 11B-404.2.7.

C. The force for pushing or pulling open a door shall be as follows: CBC Section 11B-404.2.9.

1. Interior hinged doors, sliding or folding doors, and exterior hinged doors: 5 pounds (22.2N) maximum. Required fire doors: the minimum opening force allowable by the DSA authority, not to exceed 15 pounds (66.7N). These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position.

2. The force required for activating any operable parts, such as lever hardware, or disengaging other devices shall be 5 pounds (22.2N) maximum to comply with CBC Section 11B-309.4.

D. Door closing speed shall be as follows: CBC Section 11B-404.2.8

1. Closer shall be adjusted so that the required time to move a door from an open position of 90 degrees to a position of 12 degrees from the latch is 5 seconds minimum.

2. Spring hinges shall be adjusted so that the required time to move a door from an open position of 70 degrees to the closed position is 1.5 seconds minimum.

E. Door opening clear height no less than 80" measured from top of sill to bottom of frame header stop. Projections into clear opening height not to exceed 4". California Building Code Sections 11B-404.2.3 and 1008.1.1.

F. Thresholds: floor or landing no more than 1/2" below the top of the threshold of the doorway. Change in level between 1/4" and 1/2": beveled to slope no greater than 1:2 (50 percent slope). California Building Code Sections 11B-404.2.5 and 1008.1.7.

G. Floor stops: Do not locate in path of travel. Locate no more than 4" from walls, per CBC 2019 Section 11B-204 and 11B-307.

H. Pairs of doors: limit swing of one leaf to 90 degrees to protect persons reading wall-mounted tactile signage.

I. Meet California Building Code Sections 11B-404.2.7, 11B-404.2.9, 1008.1.8 and 1008.1.9.

J. Exit Devices:

1. Panic hardware shall comply with CBC Section 1008.1.9.2. Panic hardware shall be so mounted (within 36" and 44" above finished floor as recommended) that the clear width of the exitway is not less than 32" measured between the face of the door and the opposite stop. CBC Section 11B-404.2.3 and Figure 11B-404.2.3.

2. The unlatching force of panic hardware shall not exceed 5 lbs (22.2N), applied in the direction of travel. CBC Section 11B-309.4.

3. Panic hardware shall not be provided with "Night Latch" (NL) function for any accessible doors or gates unless the following conditions are met:

   a. Such hardware has a dogging feature

   b. It is dogged during the time the facility is open

   c. Such dogging operation is performed only by employees as their job function (non-public use)

K. All classroom doors shall be lockable from the inside.

PART 2 – PRODUCTS

NOTE: ABSOLUTELY NO CONCEALED HARDWARE TO BE USED AT ANYTIME OR UNDER ANY CIRCUMSTANCES

2.01 MANUFACTURERS:

A. Listed acceptable alternate manufacturers: submit for review products with equivalent function and features of scheduled products.

ITEM:	MANUFACTURER:	ACCEPTABLE SUB:
Hinges	(IVE) Ives 3CB1	Bommer
Continuous Hinges	(IVE) Ives Aluminum Geared Series	Pemko
Pivots	DO NOT USE	
Floor Closers	DO NOT USE	
Key System	7 Pin Small Format (FAL)	Best
Locks	(SCH) Schlage L9000, LV9000	Best
Exit Devices	(VON) Von Duprin 99	District Standard
Key-Removable Mullion	(VON) Von Duprin KR4954,KR9954	District Standard
Closers	(LCN) LCN 4041,4041XP	District Standard
Auto Flush Bolts	(IVE) Ives FB30,FB40,FB50,FB60	DCI
Coordinators	(IVE) Ives COR Series	DCI
Silencers	(IVE) Ives	Rockwood
Push & Pull Plates	(IVE) Ives	Rockwood
Kickplates	(IVE) Ives	Rockwood
Stops & Holders	(IVE) Ives	Rockwood
Thresholds	(NGP) NGP	Zero
Seals & Bottoms	(NGP) NGP	Zero
Hinges	(IVE) Ives 3CB1	Bommer

2.02 HINGING METHODS:

A. Drawings typically depict doors at 90 degrees, doors will actually swing to maximum allowable. Use wide-throw conventional or continuous hinges as needed up to 8 inches in width to allow door to stand parallel to wall for true 180-degree opening. Advise architect if 8-inch width is insufficient.

B. Conform to manufacturer's published hinge selection standard for door dimensions, weight and frequency, and to hinge selection as scheduled. Where manufacturer's standard exceeds the scheduled product, furnish the heavier of the two choices, notify Architect of deviation from scheduled hardware.

C. Conventional Hinges: Steel or stainless-steel pins and concealed bearings. Hinge open widths minimum, but of sufficient throw to permit maximum door swing. Use heavy-weight hinges at doors with panic hardware and high-use door openings.

D. Continuous Hinges: Use at outswing exterior doors

1. Geared-type aluminum.

a) Use wide-throw units where needed for maximum degree of swing, advise architect if commonly available hinges are insufficient.

2. At masonry construction, coordinate with the anchoring and hollow metal supplier prior to frame installation, by placing a strip of insulation on the back of the hollow metal frame behind the rabbet section. When the frame is grouted in place, the backing will allow drilling and tapping without dulling or breaking the installer's bits.

2.03 LOCKSETS, LATCHSETS:

A. Mortise Locksets and Latchsets: Shall be Schlage L9000 Series as scheduled.

1. Chassis: cold-rolled steel, handing field-changeable without disassembly.

2. Latchbolts: 3/4 inch throw stainless steel anti-friction type.

3. Lever Trim: through-bolted, accessible design, cast lever or solid extruded bar type levers as scheduled. Filled hollow tube design unacceptable.

a) Spindles: security design independent breakaway. Breakage of outside lever does not allow access to inside lever's hubworks to gain wrongful entry.

b) Inside lever applied by screwless shank mounting – no exposed trim mount screws

c) Outside and inside trim thru bolted together and through the door

4. Spring-loaded fusible link provides fail secure mode in case of fire.

5. Universal lock case – 10 functions in one case.

6. Floating mounting tabs automatically adjusts to fit a beveled door edge.

7. Field reversible handing without opening lock case.

8. External spring cages allow for simple trim retrofit.

9. Lever rotation in both directions (up & down) for ease of use.

10. At Vandlgard locks, locked lever freely rotates down while remaining securely locked. This feature prevents damage to internal lock components when subjected to excessive force. Use at exterior doors when fixed Vandal-Resistant trim (Ives VR900 Series) is not used.

11. Furnish inside indicator at exterior classroom doors with "locked" display.

12. Independent lever rotation.

13. Furnish solid cylinder collars with wave springs. Wall of collar to cover rim of mortise cylinder.

14. Thumbturns: accessible design not requiring pinching or twisting motions to operate.

15. Strikes: 16 gage curved steel, bronze or brass with 1 inch deep box construction, lips of sufficient length to clear trim and protect clothing.

16. Scheduled Lock Series and Design: Schlage L and LV series, OMEGA design.

17. Certifications:

    a) ANSI/BHMA A156.18, Grade 1 Operational, Grade 1 Security.
    b) ASTM F1450.

18. Accepted substitutions: none

2.04 EXIT DEVICES / PANIC HARDWARE

A. General features: Shall be Von Duprin 99-2 Series as scheduled.

1. Independent lab-tested 1,000,000 cycles.

2. Use 98 Series with stainless-steel finish at gates. All other openings use 99-2 Series.

3. Push-through push-pad design. No exposed push-pad fasteners, no exposed cavities when operated. Return stroke fluid dampeners and rubber bottoming dampeners, plus anti-rattle devices.

4. 0.75-inch throw deadlocking latchbolts.

5. End caps: impact-resistant, flush-mounted. No raised edges or lips to catch carts or other equipment.

6. Mount all panic devices with through-bolt fasteners. Absolutely no concealed hardware to be used, under any circumstances.

7. No exposed screws to show through glass doors.

8. Non-handed basic device design with center case interchangeable with all functions, no extra parts required to effect change of function.

9. Releasable in normal operation with 15-lb. maximum operating force, and with 32 lb. maximum pressure under 250-lb. load to the door.

10. Flush end cap design as opposed to typical "bottle-cap" design end cap.

11. Exterior doors use XP-series devices: Static load force resistance of at least 2000 pounds.

12. Where devices span over door lite frame and the face of the selected lite manufacturer's frame is raised from the face of the door, furnish panic hardware manufacturer's fitted shims or glass-bead kits at no additional cost to the project.

13. Comply with CBC Section 1008.1.8.

B. Specific features:

1. Non-Fire Rated Devices: cylinder dogging.

2. Lever Trim: breakaway type, forged brass or bronze escutcheon min .130" thickness, compression spring drive, match lockset lever design.

3. Vandal-Resistant Trim: Use Ives VR900 Series at exterior doors whenever possible.

4. Fire-Labeled Devices: UL label indicating "Fire Exit Hardware".

5. At Paired Openings: Use key-removable mullion with 2 rim panic devices, DO NOT use concealed vertical rod devices or surface vertical rod devices.

6. DO NOT use mortise panic (9975) devices.

7. Electrically Operated Devices: Single manufacturer source for electric latch retraction devices, electrically controlled trim, power transfers, power supplies, monitoring switches and controls.

8. Removable Mullions: Removable with single turn of building key. Securely reinstalled without need for key. Furnish storage brackets for securely stowing the mullion away from the door when removed.

9. Accepted substitutions: none

2.05 CLOSERS

A. Surface Closers: Shall be LCN 4041 and 4040XP Series.

1. Full rack-and-pinion type cylinder with removable non-ferrous cover and cast iron body. Double heat-treated pinion shaft, single piece forged piston, chrome-silicon steel spring.

2. Use 4041XP closers at all exterior and high-use door openings.

3. ISO 2000 certified. Units stamped with date-of-manufacture code.

4. Independent lab-tested 10,000,000 cycles.

5. Non-sized, non-handed, and adjustable. Place closer inside building, stairs, and rooms.

6. Plates, brackets and special templating when needed for interface with particular header, door and wall conditions and neighboring hardware.

7. At 6/8 high door openings, modify closer mounting so that closer body does not interfere with 80" opening height.

8. Adjustable to open with not more than 5.0lbs pressure to open at exterior doors and 5.0lbs at interior doors. As allowed per California Building Code, Section 11B-309.4 and 11B-404.2.9, local authority may increase the allowable pressure for fire doors to achieve positive latching, but not to exceed 15lbs.

9. When provided, the sweep period of the closer shall be adjusted so that from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the landing side of the door.

10. Separate adjusting valves for closing speed, latching speed and backcheck, fourth valve for delayed action where scheduled.

11. Extra-duty arms (EDA and CUSH) at exterior and interior doors scheduled with parallel arm units.

12. Generally, closers need to swing to maximum allowable degree of opening (180 degrees if possible).

13. Generally, do not use closers with hold-open feature unless specifically approved by Facilities Engineering and Maintenance.

14. Use through-bolt fasteners at all closers.

15. Exterior door closers: tested to 100 hours of ASTM B117 salt spray test, furnish data on request.

16. Exterior doors: seasonal adjustments not required for temperatures from 120 degrees F to -30 degrees F, furnish checking fluid data on request.

17. Non-flaming fluid will not fuel door or floor covering fires.

18. Pressure Relief Valves (PRV) not permitted.

19. Supply Special Rust Inhibitor (SRI) at corrosive environments. This special corrosion resistant pretreatment, when added to the powder coat finish, gives the closer a tremendous advantage over a potentially corrosive environment.

20. Accepted substitutions: none

B. Low-Energy Door Operators: Shall be LCN 4600 Series. Comply with ANSI/BHMA A156.19 Electric power-open, hydraulically checked spring power closing. Modular construction. Finished metal cover. Field-adjustable opening force, opening speed, time-open, closing and latching speeds. Door reopens and timing cycle restores if system reactuated during closing cycle. Breakaway clutch protection from forced closing. Door, frame, motor and drive train protected by attenuated initiation of opening cycle.

1. Self-contained low-voltage power supply, terminal strip and sequencing for incorporation of hardwired electric hardware with system operation.

2. Provide concealed on/off system switch at closer body mechanism.

2.06 OTHER HARDWARE

A. Automatic Flush Bolts: Low operating force design.

B. Overhead Stops: Glynn-Johnson 80 and 100 Series. Non-plastic mechanisms and finished metal end caps. Field-changeable stop-only functions. Use only where floor or wall stops are inadvisable. When used, use heavy-weight hinges or continuous hinges.

C. Kick Plates: Rounded and relieved edges, .050 inches minimum thickness, height and width as scheduled. Sheet-metal screws of bronze or stainless steel to match other hardware.

D. Vandal-Resistant Trim: Use IVES VR900 Series at all exterior doors whenever possible.

E. Lockguards: Use at exterior outswing single doors with lockset to protect gap between door and frame at strike when Vandal-Resistant trim is not used.

F. Viewers: Provide 190-degree viewer at all exterior doors without visionlites. Install at wheelchair use eye level.

G. Door Stops: Provide stops to protect walls, casework or other hardware.

1. Unless otherwise noted in Hardware Sets, provide wall type with appropriate fasteners. Where wall type cannot be used, provide floor type. If neither can be used, provide overhead type.

2. Locate overhead stops for maximum possible opening. Consult with Owner for furniture locations. Minimum: 90 deg stop / 95 deg deadstop. Note degree of opening in submittal.

H. Seals: Finished to match adjacent frame color. Resilient seal material: polyurethane, polypropylene, nylon brush, silicone rubber or solid high-grade neoprene as scheduled. Do not furnish vinyl seal material. UL label applied to seals on rated doors. Substitute products: certify that the products equal or exceed specified material's thickness and durability.

1. Proposed substitutions: submit for approval.

2. Solid neoprene: MIL Spec. R6855-CL III, Grade 40.

3. Non-corroding fasteners at in-swinging exterior doors.

4. Fire-rated Doors, Resilient Seals: UL 263 / CBC Section 703 compliant. Coordinate with selected door manufacturers' and selected frame manufacturers' requirements. Where rigid housed resilient seals are scheduled in this section and the selected door manufacturer only requires an adhesive-mounted resilient seal, furnish rigid housed seal. Adhesive applied seals are not allowed.

5. Fire-rated Doors, Intumescent Seals: Furnished by selected door manufacturer. Furnish fire-labeled opening assembly complete and in full compliance with UL 263 / CBC Section 703. Where required, intumescent seals vary in requirement by door type and door manufacture -- careful coordination required

I. Thresholds: As scheduled and per details. Comply with CBC Section 11B-404.2.5. Substitute products: certify that the products equal or exceed specified material's thickness. Proposed substitutions: submit for approval.

1. Exteriors: Seal perimeter to exclude water and vermin. Use sealant complying with requirements in Division 07 "Thermal and Moisture Protection". Non-ferrous 1/4inch fasteners and lead expansion shield anchors, or Red-Head #SFS-1420 (or approved equivalent) Flat Head Sleeve Anchors (SS/FHSL).

2. Fire-rated openings, 90min or less duration: use thresholds to interrupt floor covering material under the door where that material has a critical radiant flux value less than 0.22 watts per square centimeter, per NFPA 253. Use threshold unit as scheduled. If none scheduled, request direction from Architect.

3. Plastic plugs with wood or sheet metal screws are not an acceptable substitute for specified fastening methods.

4. Fasteners: Generally, exposed screws to be Phillips or Robertson drive. Pinned TORX drive at high security areas. Flat head sleeve anchors (FHSL) may be slotted drive. Sheet metal and wood screws: full thread. Sleeve nuts: full length to prevent door compression.

J. Exposed Through-Bolts: Use for fastening all closers and panic hardware. Coordinate with wood doors; ensure provision of proper blocking to ensure through-bolts will not crush or deform door for mounting panic hardware and door closers. Coordinate with metal doors and frames; ensure provision of proper reinforcement to ensure through-bolts will not crush or deform door for mounting panic hardware and door closers.

K. Silencers: Interior hollow metal frames, 3 for single doors, 2 for pairs of doors. Omit where adhesive mounted seal occurs. Leave no unfilled/uncovered pre-punched silencer holes.

L. Wall- & Floor-mounted electromagnetic door holders: LCN's SEM series or approved equivalent. Incorporate into U.L. listed fire & life-safety system, doors release to allow closure and latching when door's zone is in alarm state. Use minimum projection required to allow door to open as widely as allowed by wall conditions and projection of door hardware.

2.07 FINISH:

A. Generally, BHMA 626 Satin Chromium OR BHMA 630 Satin Stainless Steel. Generally, use stainless steel finish only at gate openings.

1. Areas using BHMA 626 to have push-plates, pulls and protection plates of BHMA 630, Satin Stainless Steel, unless otherwise noted.

B. Door closers: factory powder coated to match other hardware, unless otherwise noted.

C. Aluminum items: match predominant adjacent material. Seals to coordinate with frame color.

2.08 KEYING REQUIREMENTS:

A. Key System: Seven Pin Small Format interchangeable core

1. Best cores to be pinned by owner

2. Temporary cylinders/cores remain supplier's property.

3. Furnish 10 construction keys.

4. Furnish 2 construction control keys.

5. Furnish 200 keyblanks and 10 control keyblanks.

6. Key Cylinders: furnish 7-pin solid brass construction.

7. Furnish 20 extra "0" bitted cores.

B. Cylinders/cores: keyed at by Owner, O bitted from factory of lock manufacturer where permanent records are maintained. Locksets and cylinders same manufacturer.

1. 4 keys per cylinder, 10 control keyblanks, 200 additional keyblanks.

C. Bitting List: use secured shipment direct from point of origination to District locksmith at completion.

D. Approved Finish Hardware Submittal: furnish 2 copies to District locksmith at completion.

PART 3 - EXECUTION

3.01 ACCEPTABLE INSTALLERS:

A. Can read and understand manufacturers' templates, suppliers' hardware schedules and printed installation instructions. Can readily distinguish drywall screws from manufacturers' furnished fasteners. Available to meet with manufacturers' representatives and related trades to discuss installation of hardware.

3.02 PREPARATION:

A. Ensure that walls and frames are square and plumb before hardware installation. Make corrections before commencing hardware installation.

B. Locate hardware per SDI-100 and applicable building, fire, life-safety, accessibility, and security codes.

1. Notify Architect of code conflicts before ordering material.

2. Locate levers, key cylinders, t-turn pieces, touchbars and other operable portions of latching hardware between 34 inches to 44 inches above the finished floor, per CBC Sections 11B-404.27 and 11B-309.4.

3. Where new hardware is to be installed near existing doors/hardware scheduled to remain, match locations of existing hardware.

C. Overhead stops: before installing, determine proposed locations of furniture items, fixtures, and other items to be protected by the overhead stop's action.

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 concrete and finish smooth

3. Cut and weld existing steel frames currently prepared with 2-3/4" height strikes. Cut an approx. 8" section from the strike jamb and weld in a reinforced section to accommodate specified hardware's strike.

4. Patch and weld flush filler pieces into existing door hardware preparations in steel doors and frames, leave surfaces smooth.

5. Glue in solid wood block fillers to fill cut outs in existing wood doors, sand surfaces smooth. Alternatively, use an approved epoxy-based wood filler product, submit product data for approval.

3.03 INSTALLATION

A. Install hardware per manufacturer's instructions and recommendations. Do not install surface-mounted items until finishes have been completed on substrate. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate for proper installation and operation. Remove and reinstall or replace work deemed defective by Architect.

1. Gaskets: install jamb-applied gaskets before closers, overhead stops, rim strikes, etc; fasten hardware over and through these seals. Install sweeps across bottoms of doors before astragals, cope sweeps around bottom pivots, trim astragals to tops of sweeps.

2. When hardware is to be attached to existing metal surface and insufficient reinforcement exists, use RivNuts, NutSerts or similar anchoring device for screws.

3. Use manufacturers' fasteners furnished with hardware items or submit Request for Substitution with Architect.

4. Replace fasteners damaged by power-driven tools.

B. Locate floor stops no more that 4 inches from walls and not within paths of travel. See paragraph 2.2 regarding hinge widths, door should be well clear of point of wall reveal. Point of door contact no closer to the hinge edge than half the door width. Where situation is questionable or difficult, contact Architect for direction.

C. Core concrete for exterior door stop anchors. Set anchors in approved non-shrink grout.

D. Locate overhead stops for minimum 90 degrees and maximum allowable degree of swing.

E. Drill pilot holes for fasteners in wood doors and/or frames.

F. Lubricate and adjust existing hardware scheduled to remain. Carefully remove and give to Owner items not scheduled for reuse.

3.04 REMODEL OR REPAIR TO EXISTING FACILITY

A. Field verify existing conditions and measurements prior to ordering hardware. Fill existing hardware cut outs not being used by the new hardware. Remove existing hardware not being reused.

B. Disable or remove existing floor closers where they exist. If disabled cut or remove spindle.

C. 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.

D. Provide proper brackets to accommodate the mounting of closers on doors with flush transoms.

3.05 ADJUSTING

A. Adjust and check for proper operation and function. Replace units, which cannot be adjusted to operate freely and smoothly.

1. Hardware damaged by improper installation or adjustment methods: repair or replace to Owner's satisfaction.

2. Adjust doors to fully latch with no more than 1 pound of pressure.

3. Adjust delayed-action closers on fire-rated doors to fully close from fully-opened position in no more than 10 seconds.

4. Adjust door closers per 1.9 this section.

B. Inspection: Use hardware supplier's consultant or consultant's agent. Include supplier's report with closeout documents.

C. Final inspection: Installer to provide letter to Owner that upon completion installer has visited the Project and has accomplished the following:

1. Re-adjust hardware.

2. Evaluate maintenance procedures and recommend changes or additions, and instruct Owner's personnel.

3. Identify items that have deteriorated or failed.

4. Submit written report identifying problems

3.06 DEMONSTRATION:

A. Demonstrate mechanical hardware and electrical hardware systems, including adjustment and maintenance procedures.

3.07 PROTECTION/CLEANING:

A. Cover installed hardware, protect from paint, cleaning agents, weathering, carts/barrows, etc. Remove covering materials and clean hardware just prior to substantial completion.

B. Clean adjacent wall, frame and door surfaces soiled from installation/reinstallation process.

3.08 SCHEDULE OF FINISH HARDWARE

A. See door schedule in drawings for hardware set assignments.

B. Manufacturers and their abbreviations used in this schedule

GLY	Glynn-Johnson
IVE	H.B. Ives
LCN	LCN Closers
NGP	National Guard Products
SCH	Schlage Lock Company
VON	Von Duprin

Hardware Group No. LV-EXT
For use on Door #(s):
001
Provide each SGL door(s) with the following:

1	EA	CONTINUOUS HINGE	112HD		628	IVE
1	EA	CLASSROOM HOLDBK	LV9076BDC LLL OMEA L283-150		626	SCH
1	EA	MORTISE CYL TURN	09-900 114 36-083		606	SCH
1	EA	SFIC CORE	CB807 SFIC		626	FAL
1	EA	DOOR PULL	VR900 LLP		630	IVE
1	EA	SURFACE CLOSER	4040XP EDA		689	LCN
1	EA	WALL STOP	WS406/407CCV		630	IVE
1	EA	PERIMETER SEALS	328AA HEAD AND JAMBS		AA	ZER
1	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	526A-223		A	ZER

END OF SECTION